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COMPUTERWORLD

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Documentation: Revamped with the end user in mind

By Paul Gillin
CW Staff

Just a few years ago, sales representatives for Martin Marietta Data Systems, Inc. boasted to potential customers that the company's MAS-Manufacturing system came complete with a 24-volume set of documentation. Such voluminous paper was proof that the software was among the best documented systems on the market, they said.



Today, the Martin Marietta sales pitch is quite different. It now hails the fact that the MAS-Manufacturing documentation has been cut to three volumes, one of which is targeted strictly toward the nontechnical end user, according to Michael Belcham, manager of manufacturing products at Martin Marietta.

Martin Marietta's change in philosophy is one example of a larger trend in the software industry. Companies that for years have geared their documentation toward a sophisticated data processing audience are now simplifying and streamlining that information in a push to appeal to the end user. Many firms are also increasingly tying their documentation materials more closely to their education materials in an effort to relieve the burdensome MIS task of end-user training.

"The redefinition [of the Martin Marietta documentation] relates to the disillusionment of users with complex data processing systems and to their hunger for simple management tools," Belcham said.

"There was a time when DP people expected users to learn DP jargon," said Stephen Gerrard, product marketing director at Applied Data Research, Inc., based in Princeton, N.J. "Now we have to reach out and meet the users on their own terms."

In many cases, the revision of documentation has involved major commitments of time and money. Atlanta-based Management Science America, Inc., for example, undertook a project to rewrite totally the documentation for its mainframe software products three years ago. Thirty man-years and more than $1 million later, MSA has restructured manuals for 15 of its 17 mainframe products, gearing them toward

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TOP OF THE NEWS

National Advanced Systems Corp. expanded its family of 6600 series machines with a top-end processor addition designed to compete head-on with IBM's 4381 Model 2. **Page 2.**

■

Digital Equipment Corp. was fined $1.5 million following a U.S. Department of Commerce investigation of allegations that the company's West German subsidiary sold restricted computer equipment to a company linked to the Soviet Union. **Page 4.**

■

Picking up the pieces. Management Assistance, Inc. announced that Bell Atlantic is the proposed buyer of MAI's Sorbus Service Division, for $175 million in cash. **Page 4.**

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Thinking smart. A conglomerate found better results when it switched to a lesser known integrated micro software package after finding that a popular package came up short of fulfilling its needs. **Page 10.**

■

An important step in curbing software piracy. Louisiana has become the first state to enact a "shrink-wrap" licensing law, which mandates that a consumer be bound by the specific terms of a vendor's license agreement if a software package is opened or used. **Page 27.**

■

Zilog General Systems Division announced a family of Unix-based multiuser micros, the high end of which reportedly supports up to 40 users. **Page 101.**

■



DP MANAGER PROFILE

From bank teller to MIS manager

By John Desmond
CW Staff

HARTFORD, Conn. — How does a mother working as a bank teller to support her three children make the transition to a management career in data processing for a leading insurance firm?

Ask Joan H. Johnston, because that unusual career path is the one she followed to become a systems manager in the DP department at Travelers Corp. She is now responsible for managing the Computer Store, an effort to bring personal computers to professionals at Travelers, which has 30,000 U.S. employees, including almost 10,000 in the headquarters here.

Johnston is also the company's representative to the IBM users group Guide International, of which she was named manager of the Division for Automation of Business Strategies and Functions (AU Division) in July. The AU Division is an attempt to consolidate all end-user groups within Guide International.

Johnston's 21-year career in data processing got its start soon after NCR Corp. got the job of automating the bank where she was working as a teller and

See **JOHNSTON** page 12

Amdahl, NAS trim unit prices on high end

By Jeffry Beeler
CW West Coast Bureau

Two West Coast suppliers of IBM-compatible mainframes responded last week to IBM's latest round of price cuts for its large-scale processors and disk systems.

Amdahl Corp. trimmed by 9% to 16% the purchase prices for its 580 series of high-end CPUs, according to a company spokesman. The vendor also lowered by 12% the purchase price for its 6380 disk system.

National Advanced Systems Corp., meanwhile, pared the purchase prices for its 8003, 9000 and 9100 mainframe families by 12% to 16%, according to an NAS spokesman. In addition, the firm cut 10% from the purchase price of its 7380 disk system.

In a related move, Amdahl boosted the lease charges for its 6280 and 6380 disk modules by 10% to 17%, the company spokesman said. Similar increases in lease prices also apply to the firm's 6880 disk system controller.

The rise in Amdahl's leasing charges takes effect on Oct. 15, in contrast to the company's purchase price reductions, which become effective immediately, the spokesman said.

No increases in lease prices were announced last week by NAS, although such a move is reported to be under consideration.

In the wake of last week's price reductions by Amdahl, a 24M-byte, 24-channel configuration of the company's 5860 uniprocessor now costs $2.56 million. Previously, the same machine cost $2.91 million, the Amdahl spokesman said. The 5860 forms part of a high-end mainframe line that includes two other uniprocessor models, the 5840 and 5850; two dual processors, the 5867 and 5870; and a pair of multiprocessor systems, the 5868 and 5880.

Also as a result of the latest Amdahl price cuts, a 6380 disk unit and 6880 controller that together used to sell for $148,030 now cost $130,170, the spokesman said. Under a two-year lease, however, the monthly payments for a 6380 have jumped from $5,595 to $6,434.

On the NAS side, the purchase price of a 9060 processor incorporating 16M bytes of main memory and 16 channels has shrunk from about $2.73 million to roughly $2.31 million, the company spokesman said. In addition, NAS has lowered the purchase price of a 10M-byte 7380 disk storage module from $355,000 to $319,500.

Both the Amdahl and the NAS price changes follow a recent, comparable move by IBM [CW, Sept. 3]. Under a revised pricing structure that IBM announced late last month, the cost of buying a 3080 X model mainframe has decreased by 12% to 16%. The purchase prices for the industry giant's 3380 disk unit and 3880 disk controller, by contrast, have fallen by 10%.

Coupled with the recent announcement of IBM's six 3080 X model mainframes,

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NEWSPAPER

NEWS

NAS extends 6600 series processors with top line model

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. today extended its medium-scale mainframe line at the high end with the introduction of a processor that reportedly equals or surpasses the performance of an IBM 4381-2, for a 5% lower price.

NAS's Model 6660 comes with a two-year warranty that applies equally to the three other members of the vendor's 6600 series of mid-range processors, according to Dennis Stein, the company's manager of intermediate systems marketing. In addition to the top-of-the-line 6660, the 6600 family includes Models 6620, 6630 and 6650, all of which previously came with a one-year warranty.

Announcement of the 6660 and the two-year warranty was part of a wide-ranging performance enhancement of the 6600 series. Also included in the face-lift was an across-the-board increase in the product line's main memory and channel capacity.

As a result of the general performance upgrade, NAS has increased the minimum main memory capacity for all its 6600 family machines to 8M bytes, Stein said. Prior to today's announcement, the entry-level 6620 started with 2M bytes, whereas both the 6630 and 6650 were minimally configured with 4M bytes each. For current users with less than 8M bytes of main memory, NAS is offering memory upgrades for $5,000 per 1M byte. This price remains in effect until year's end, a spokesman said. "We did an evaluation of our customer base and realized that the average user has 8.5M bytes of main memory," Stein said. "We also recognized that in today's operating system world, a user really needs at least 8M bytes. So it was almost ludicrous to sell configurations with just 2M or 4M bytes."

As part of its enhancement of the 6600 line, NAS also increased the maximum channel capacity of the 6650 from 10 to 12 channels and the maximum channel capacity of both the 6620 and 6630 from five to eight channels, Stein said.

In a related development, the supplier of IBM-compatible processors announced today the availability of its high-speed arithmetic feature for all members of the 6600 family. In the past, the feature, which boosts CPU throughput for technical applications by 7% to 20%, was available only on the 6650, Stein said.

With a machine cycle rated at 43 nsec, the 6660 reportedly outperforms the 6650, the previous top-of-the-line member of NAS' mid-range processor family, by 10% to 13%. At the same time, the 6660 is also "equal to or greater than" its nearest IBM counterpart, the 4381-2, in internal throughput, Stein said.

In addition to providing at least 5% better price/performance than its IBM equivalent, the 6660 runs DOS/VSE in native mode, he added.

Compatibility strategy

Like its three 6600 series sister systems, the 6660 embodies NAS' strategy of ensuring compatibility and field-upgradability within each of the company's product lines. Users of existing 6620s, 6630s or 6650s can expand to any larger member of the mainframe family by enhancing their machines' clock boards and thus lowering their cycle times.

On the average, such an upgrade takes two to four hours, including test time, Stein said.

A minimum 6660 configuration requires 8M bytes of main memory, expandable in 4M- or 8M-byte increments to 16M bytes. The high-end intermediate processor also comes with at least five channels and expands to as many as 12.

A basic 6660 configuration with 8M bytes of main memory and five channels costs $475,000. Shipments of the top-of-the-line 6600 series machines begin in December, as do deliveries of upgrade kits for the processor family's three smaller models.

NAS is headquartered at 800 E. Middlefield Road, Mountain View, Calif. 94042.

NATIONAL ADVANCED SYSTEMS CORP.

System / Characteristics	AS/6620	AS/6630	AS/6650	AS/6660
Relative Performance[1]	74	100	125	140
Mips[2]	1.6	2	2.4	2.8
Memory Size in Bytes (Minimum-Maximum)	8M-16M	8M-16M	8M-16M	8M-16M
Purchase Price[3] (Memory Size)	$255,000 (8M)	$341,500 (8M)	$417,500 (8M)	$475,000 (8M)
Lease Price (Lease Term)	$8,580 (2 Year)	$10,315 (2 Year)	$12,400 (2 Year)	$14,155 (2 Year)
Machine Cycle Time (Nsec)	60	60	50	43
Channels (Minimum-Maximum)	5-8	5-8	5-12	5-12
Cache (Buffer) Size	64K	64K	64K	64K
Bus Architecture?	No	No	No	No
Price per 1M byte of main memory	$9,500	$9,500	$9,500	$9,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, penpherals and software.
2. CW estimates.
3. Includes processor, console, power supply and all prerequisites.

CW CHART

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last month's price cuts by Big Blue are expected to increase the financial pressure on both Amdahl and NAS.

Real test

"But the real test for those companies won't come until IBM introduces [follow-on] products" for its aging 3080 family, according to Bill Frank, senior consultant at Info Corp. in Cupertino, Calif.

During the past two or three years, both Amdahl and NAS have been able to retain their shares of the overall IBM marketplace, even though unit shipments of 3080-class CPUs, both Big Blue and plug-compatible, have steadily declined, Frank said.

"But when IBM comes out with its next line of machines," he asked rhetorically, will Amdahl and NAS "continue to be able to hold their own technologically?"

Amdahl is headquartered at 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

NAS is headquartered at 800 E. Middlefield Road, Mountain View, Calif. 94042.

Hot tip? Tell it to the hot line

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

NEWS SUMMARY

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Product Spotlight: 32-bit workstations/**16**

CW at the Info Center Conference & Exposition: Half to three-quarters of the employees at the Bank of America will be using micros by 1990, according to its product management group vice-president . . . A properly managed information center tracks its objectives and benefits in order to prove its effectiveness, one speaker advised . . . DP departments need to stop trying to control end-user computing and to start laying strategy for their development, conference attendees were told . . . The key to improving relations between end users and DP was seen by one conference speaker to be understanding the process of application design/**20-26**

Louisiana has become the first state to enact a "shrink-wrap" licensing law/**27**

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Remote terminals installed around the country have given the public greater access to the Federal Election Commission's campaign finance data base/**32**

The Institute for Certification of Computer Professionals has cautioned industry employers about the possibility of bogus certificates/**33**

A Brandeis University professor is using a carefully constructed data base to recreate an ancient Mexican city/**35**

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DEC fined $1.5 million following export investigation

By Peter Bartolik
and Bryan Wilkins
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. last week agreed to a $1.5 million fine imposed by the U.S. Department of Commerce to settle an investigation of allegations that its West German subsidiary sold restricted computer equipment to a company linked to the Soviet Union.

Last year DEC superminicomputers en route to the Soviet Union were intercepted in Europe [CW, Nov. 21, 28]. It was revealed that for a 1½-year period prior to the seizure, the DEC subsidiary had sold restricted technology items to a company run by a man linked to the Soviet KGB, the same man believed to be behind last year's foiled smuggling attempt.

The Commerce Department said the fine was the largest ever in an export violations case. The department will require that DEC pay $1.1 million, suspending payment of the additional $400,000 for three years, after which payment will be waived if no further violations have occurred.

DEC said it did not admit wrongdoing, but agreed to the settlement to avoid inconvenience to its customers and "lengthy and costly litigation."

Distribution license

Also last week, DEC was given approval for a two-year distribution license that permits the company to export shipments under one general license; as a result of last year's seizures, DEC had been required to obtain individual licenses for each shipment.

The negotiated settlement involved an investigation into sales of computer equipment by Digital Equipment GmbH, DEC's subsidiary in West Germany. The subsidiary allegedly sold top-of-the-line DEC computers to a company controlled by Richard Mueller, a native of West Germany identified by *The Times* of London last year as a Soviet secret police and intelligence agent and alleged to be behind the failed attempt to ship DEC VAX-11/782 equipment to the Soviet Union last year.

Mueller, a fugitive from a U.S. federal indictment handed down in 1979 charging him with export violations, is named in a Commerce Department "denied" list of individuals and companies banned from receiving sophisticated U.S. high-technology materials.

A Commerce Department spokesman said that between August 1981 and January 1983, Digital Equipment GmbH "made numerous sales of DEC computers and computer-related equipment to Richard Mueller, through his firm Deutsche Integrated Time (DIT)."

Commerce Secretary Malcolm Baldrige, in a prepared statement, said the transactions "raised national security concerns because they included two [DEC] VAX-11/780 computers." Baldrige said DEC had cooperated with the investigation and had voluntarily divulged relevant information.

Richard Berube, a spokesman for DEC, said the company was not aware of Mueller's involvement with DIT at the beginning of the time period covered by the settlement, but eventually did become aware of his involvement. When the transactions first began, Berube said, "we had checked the Commerce 'denied' list and [DIT] was not on it."

Berube said the company had not instituted disciplinary procedures against any employees because "none are warranted." However, the company has taken aggressive steps to ensure its administrative procedures are as effective as possible in complying with export regulations. "In retrospect, the [administrative] system we had in place two or three years ago obviously could stand improvements, which we have done," he said.

For DEC, the settlement was the second time this year that it agreed to pay a penalty to the government while not admitting wrongdoing. Earlier this year, it paid $3.2 million to the General Services Administration to settle allegations that it had fraudulently mispriced some $70 million worth of equipment sold to the government [CW, Jan. 9].

Recent penalty unrelated to previous VAX shipments, DEC says

The $1.5 million fine the U.S. Department of Commerce levied against Digital Equipment Corp. last week had "no connection" to an alleged attempt by Richard Mueller, a native of West Germany, to ship VAX-11/782 equipment to the Soviet Union last year, a DEC spokesman said.

That equipment was intercepted on one ship during two raids instigated last year by the U.S. Customs Service in West Germany [CW, Nov. 21] and Sweden [CW, Nov. 28].

The Commerce Department declined to rule out the possibility that last year's interception was related to the settlement. A government source familiar with the investigation who asked not to be identified told *Computerworld* that a number of transactions were involved in the case and, because of a lack of serial numbers on equipment involved in the case, "we don't know precisely which two computers are exactly where."

Richard Berube, a DEC spokesman, said all equipment shipped by DEC is stamped with identifying serial numbers.

The equipment involved in the seizures last November was reportedly shipped from the U.S. by an unidentified export company based in New York and was destined for South Africa, where Mueller had taken up residence and where he controlled a number of so-called shell companies. According to a Customs Department investigation, the company received 15 shipments of critical U.S.-made high-technology equipment, including the DEC equipment, valued at $7 million [CW, Jan. 9]. The DEC equipment was subsequently shipped via Hamburg, West Germany, where the first interception was made, and later to Helsingborg, Sweden, where the second seizure from the same consignment was made.

Mueller's involvement touched off a storm of bureaucratic infighting and accusations in Washington, D.C. Anonymous Department of Defense officials were quoted by *The Washington Post* late last year as saying Mueller's firm "was under investigation by one part of the Commerce Department, while another part of the Commerce Department was issuing [the firm] licenses."

Mueller had been involved in the 1970s in two highly publicized export violations cases, including the export to the Soviet Union of a complete assembly line for mass production of microprocessors. Despite that involvement, "no sanctions were imposed against [Mueller] until the end of August [1981]," when he was placed on the denied list and barred from trading with U.S. companies until May 31, 2001 [CW, Sept. 14, 1981].

Bell Atlantic to acquire Sorbus, if Justice Department approves

By David Olmos
CW Staff

NEW YORK — Management Assistance, Inc. (MAI) last week disclosed that Bell Atlantic Corp. is the proposed purchaser of its Sorbus Service Division.

MAI announced in August that it had found a buyer for its profitable third-party computer service division, but declined to name that purchaser until last week. Philadelphia-based Bell Atlantic has signed a letter of intent to purchase Sorbus for $175 million in cash.

The latest announcement followed on the heels of the U.S. Department of Justice's recommendation late last month to allow several regional telephone holding companies to enter into lines of business besides those allowed by the AT&T divestiture consent decree. The MAI-Bell Atlantic agreement is also subject to approval by U.S. District Court Judge Harold Greene.

Jack Baird, a Bell Atlantic spokesman, said the regional holding company is optimistic that the federal court will approve the plan. He said that optimism is based on the Justice Department's recommendation to allow Nynex Corp. and Pacific Telesis Group, two other regional holding companies, to sell a range of computer equipment and related hardware.

Baird said Bell Atlantic expects to keep the present structure of Sorbus essentially intact. "We don't anticipate any significant changes in structure or personnel," he said.

"We hope to position ourselves nationally as a provider of quality maintenance services for computer and telecommunications equipment, recognizing that the technologies involved in data processing and telecommunications will continue to converge," Baird said.

Bell Atlantic owns local telephone operating companies in six mid-Atlantic states and Washington, D.C. It also owns Bell Atlantic Mobile Systems, a cellular mobile telephone service company, and Bell Atlanticom Systems, a telecommunications systems firm. It owns a partnership interest in a paging and cellular marketing company and has announced its intention to acquire a lease financing company and a telecommunications equipment marketing firm.

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DOCUMENT from page 1

a broader audience without increasing page counts, officials said.

MSA's documentation is structured into three major volumes for each package, according to Jack Shaw, manager of documentation. A data processing guide is geared toward the DP professionals and covers the technical intricacies of the software. An applications manual, designed for non-DP users, covers the business functions of the package and explains how it can be customized for the user's environment. An operations manual mirrors the applications manual, but describes the actual procedures that users must employ at the keyboard.



As is the case with so many current trends in large-scale computing, changes in documentation have been inspired by microcomputers. "People have seen some very good documentation on the micro side, and that leads them to expect it on the mainframe side," said Frank Netzel, president of Frank Netzel & Associates, Inc., a consulting firm in Barrington, Ill.

In MSA's case, the company's 1981 acquisition of Peachtree Software, Inc. gave the mainframe maker some new ideas about documenting systems. "The micros were small and easy to use, and their documentation was small and easy to use, also," Shaw said.

The changes have been brought about in part by an increase in the number of software company executives who use their own company's products, according to Edmond Weiss, president of Edmond Weiss Services, a Cherry Hill, N.J.-based consulting and education firm in the areas of documentation and technical communications. "The embarrassing situation is when the executive of company A finds out his manuals are not as readable as the manuals of company B," Weiss maintained.

Perhaps the major impact of micro documentation has been its task orientation, that is, explaining how to accomplish a specific task rather than simply describing available commands and procedures. "In all our user-type manuals, we're going to a task orientation," explained Adelaide Ketchum, manager of technical communications for systems and microprocessor software at Cullinet Software, Inc. in Westwood, Mass. The changes even apply to such DP-oriented products as Cullinet's IDMS/R data base management system. "IDMS/R documentation now defines how to define a record or a table rather than defining the capability to produce a record or table," Ketchum said.

Ketchum noted that the process of writing documentation for Goldengate, Cullinet's first micro product, has spawned a whole new attitude toward large systems documentation. "The style is more relaxed in Goldengate documentation, and I can see that carrying over to the mainframe side," she said.

Many companies are also now dividing documentation into several major categories, each oriented toward a different class of user. Martin Marietta, for example, has split its MAS-Manufacturing documentation into a user guide, a reference guide and a technical guide. While the technical guide contains much of the information that would have appeared in previous manuals, the user guide assumes no DP expertise, Belcham said.

SAS Institute, Inc. has recently realigned its technical writing department to reflect the new divisions. Whereas all documentation previously came from a single group, the department is now organized into technical documentation, user documentation and educational services groups, according to Alice Allen, manager of the department. While the technical and user sides concentrate on manuals for their respective audiences, the education services group draws material from both and folds it into its own training materials. Another new thrust by many vendors is in on-line documentation. Help screens, which once were rudimentary lists of commands, are becoming increasingly sophisticated, so much so that users in some cases can be using the system in an hour or two.

> *'People have seen some very good documentation on the micro side, and that leads them to expect it on the mainframe side.'* — Frank Netzel, president, Frank Netzel & Associates

Ideal, ADR's application development system, incorporates what that company calls an "Intelligent Help Facility" that presents Help screens that correspond to the user's screen. "If you're painting a screen and get stuck, you press one button and get help on the subject you're working on at that time," Gerrard said. "The whole idea is to eliminate any need for the user to get up from the terminal." The facility also includes procedures that allow users to build their own Help messages into the system, he said.

ADR and other vendors have also taken a cue from the disk-based tutorials that are available for many micro packages and that are expanding into the area of computer-based training (CBT). The tutorials allow the user to begin working at the terminal immediately, without having to read even introductory documentation in some cases. Generally, it is used at the introductory level, with hard-copy documentation available as a backup.

Consultant Weiss believes CBT, when combined with video training, is the best way to escape the desk-and-book environment that intimidates so many people.

"It's been said that the best way to teach someone is to make it look as little like school as possible," he said. "CBT and video training have got to be the best things to come along in that area. I suspect that virtually every vendor of large products is going to have CBT associated with it in a year or two."

ADR's IBM Personal Computer-based Adroit product can be used to guide users through interactive training sessions, Gerrard said. A second level of Adroit training simulates mainframe screens and procedures, essentially allowing the Personal Computer to emulate the mainframe software without tying up the CPU. Adroit can be used with video training, with the combination costing about $1,900 for each mainframe product. Gerrard said the company hopes to extend Adroit to all ADR products by the middle of next year.

Comshare, Inc. has also integrated training and documentation for its System W decision support system (DSS). In both classroom and computer-based training, educational material is cross-referenced with Comshare's course guide and reference documentation, according to Dick Richards, Comshare's DSS marketing manager. "By the time you've left the classroom, you're familiar with the product and with the manuals."

As part of the revamp, Comshare has increased System W documentation from a single, 600-page manual to three volumes encompassing 2,000 pages, Richards said. Ten full-time writers now work on documentation alone. The rewrite has consumed eight man-years and about $250,000.



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Retailers meet set for Oct. 21-24

TORONTO — A conference and exhibition for retailers will be held at the Toronto Hilton Harbour Castle here Oct. 21-24.

The National Retail Merchants Association (NRMA) Conference is designed to help retailers update their knowledge of computer and automation systems, according to the sponsor.

Session topics will include telecommunications; integration of minicomputers, personal computers and other devices within the store; automation for the small retailer; fashion merchandise allocation systems; data capture alternatives; electronic funds transfer and debit cards; innovations in areas such as electronic mail; and microcomputers as point-of-sale systems, according to the conference sponsor.

Speakers include presidents, vice-presidents, owners, consultants and directors of retail businesses.

Attendees will be invited to select topics of interest to be scheduled each day for informal discussions.

Conference fees are $390 for NRMA and Retail Council of Canada members and $625 for nonmembers, the sponsor said.

Further information can be obtained from the Information Systems Division, NRMA, 100 W. 31st St., New York, N.Y. 10001.

NEWS

Users' documentation requirement: Get to the point

By Paul Gillin
CW Staff

On-line tutorials and folksy text are nice, but users interviewed recently by *Computerworld* said the most important thing end-user documentation can do is get the user productive quickly.

"People want to use the product as fast as possible," said Allan Karan, manager of office procedures within the information services department at Sperry & Hutchinson Co. in New York. Karan said many vendor manuals could stand to use "less verbiage, more illustrations and short, precise sentences."

Karan also said that illustrations and diagrams are critical. "If the manual tells you to do something on the screen, it should show [the screen]," he said. "Vendor manuals tend to explain what's going on in the system, and that's not what the casual user wants. He wants to get up and running."

David Maurer, a senior systems analyst at Liberty Mutual Insurance Co.'s DP center in Portsmouth, N.H., noted that employee turnover heightens the need to get users up to speed quickly. "You want documentation at the level where people who have been on the job for a month can at least find 90% of what they need."

However, Maurer said, short documents are not necessarily better. He said his company bought documentation from an independent vendor for IBM's Consolidated Functions Ordinary package. The manuals far outweighed those supplied by IBM, but are much easier to use, Maurer said.

"It tells you what every transaction does, where it goes and what's going to happen to it," he said. "It goes the width of my desk, but because of the way it's structured, it's very easy to use."

In addition, the independently supplied manuals are color coded, heavily cross-indexed and use flow diagrams and illustrations frequently. DP jargon that fills the IBM manual is defined in plain English, Maurer said.

He noted that although the manuals are not DP-oriented, programmers love it. "It shows the logic and data flows and describes each transaction," Maurer said. "It's especially good for new programmers."

The main problem with most documentation from vendors is one of poor anticipation of potential problems, said Eunice Malley, senior technical consultant for publications at the Bank of America in San Francisco. "A lot of vendors use programmers or engineers to write their manuals. They're so close to what they're writing about that they don't see questions the user might have," she said. Malley noted that the problem is particularly acute with new products that vendors are rushing to get to market.



Maurer said documentation is an essential item to consider before buying a package. "On a one-to-10 scale, I'd rate it a 10," he said. Because sales representatives sometimes promise functions that are not actually contained in the package they are selling, documentation can help the user hedge his bets, he said.

"On the highest level, you want a system overview that lays out and names the subsystems," he said. "Then you want write-ups of the subsystems. Even your code should be heavily commented."

Although user-friendliness is important, Malley said, documentation should avoid gimmickry that obscures the message.

"A lot of software documentation gets kind of chatty in trying to make users feel less frightened. I personally don't like that," she said. "I think users just want to be told simply what to do."

Both Karan and Malley said their departments screen and modify vendor manuals before releasing them to the users. Although significant problems remain, they both said they have noticed improvements taking place.

"I feel encouraged," Malley said. Karan added, "Documentation is more structured today and indexed better."

Micro meet set for Oct. 1-3

SAN FRANCISCO — A three-day conference titled "Personal Computers in Business — the Micro-Mainframe Connection" will be held Oct. 1-3 in the Hyatt Union Hotel here.

The conference will focus on linking microcomputers to mainframes within the corporate environment, according to its sponsor, the National Institute for Management Research (NIMR).

The registration fee is $595 per person. Organizations with three or more attendees can pay a $295 fee per person.

More information is available from the Public Relations Department, NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

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Standards for the discerning judge of vendor manuals

What criteria should you use to evaluate vendor documentation? Here are 10 features to examine. The list is provided by Christine Browning, senior software technical writer at Tandem Computers, Inc. in Cupertino, Calif., and author of the recently published book, *Guide to Effective Software Writing*.

■ **Tutorials.** These quick-start lessons get users on the system within minutes and allow them to learn as they go along.

■ **Task orientation**. Manuals should present tasks the user might want to accomplish and describe simply how those tasks can be performed. Highly technical information can always be isolated in the back of the manual.

■ **Perspective**. Documentation should not talk down to the user. Make sure the manuals are geared toward the audience in your installation.

■ **Glossaries**. A new product typically introduces many new words. Users need a place to find definitions quickly.



■ **Good index**. "I think there are more complaints about missing or bad indexes than anything else," Browning said. Simply checking the length of an index can give you an idea of how thorough it is. You should be able to find an entry under several different keywords. If there are many entries for each keyword, the index is too general.

■ **Tight writing**. If you scan the documentation and see many long sentences and subordinate clauses, it is probably a sign of poor writing.

■ **Technical background**. A lot of manuals look good until you start to use them. Look for evidence of questions that have been left unanswered or possible problems that have not been addressed.

■ **Organization**. You can often tell how well a manual is organized just by looking at contents table. Continuity is good; redundancy is bad.

■ **Preface**. Although few people read this part of the documentation, it is often the best way to find out who is the manual's target audience.

■ **Document size**. Users like to have a manual they can keep open at their terminals while they work. Small binders fit the bill. Large bound manuals are often unwieldy and difficult to use.

It is important to remember that vendors will probably not improve their documentation unless they are aware that something is wrong, Browning said. Many vendors provide a response card that users can fill out to suggest improvements. "Give an opinion and try to be specific," she said. "If nobody says anything, the vendors will assume the documentation is good."

User documentation field laden with opportunity for writers

Software technical writers are reaping a bumper crop of job opportunities and new responsibilities as a result of the new vendor focus on end-user documentation, according to vendors interviewed recently.

At many companies, documentation departments that previously were small operations have expanded dramatically in the last two years. Technical writers are also becoming more closely involved in the system development process, vendors said.

In her five years at Cullinet Software, Inc., Adelaide Ketchum, manager of technical communications for systems and microprocessor software, has watched "the whole department mature a lot. The role of documentation has taken on a new, improved image," she said. The documentation function at Cullinet is divided into three departments consisting of more than 50 writers and production personnel.

At SAS Institute, Inc., the technical writing department has grown from a staff of 13 last November to 27 today, according to Alice Allen, manager of the department. The staff is organized into two major groups. Technical documentation writers generally have programming experience or technical academic training, while user documentation writers tend to have statistical backgrounds and the ability to translate those complex concepts into nontechnical terms.

Earlier involvement

Allen added that documentation writers "are becoming involved earlier and earlier in development. Several years ago we didn't get involved until after some work was done," she said. "Now we get in at the beginning. In some cases, we actually influence development [of the software]."

Applied Data Research, Inc. has steadily expanded its written documentation staff and has added new personnel in the education area. Three people now build training courses, including one person who works mostly on computer-based training. Script writers have also been added to build scripts for videotapes, according to Stephen Gerrard, product marketing director.

Management Science America, Inc.'s (MSA) $1 million project to restructure its documentation involved breaking out the function into a separate group, hiring seven new technical writers and two top writers from the product development groups and adding a staff of six production personnel. The documentation department now has an annual budget of about $500,000, according to Jack Shaw, MSA's manager of documentation.

Sophisticated software

In addition, MSA technical writers use some of the company's most sophisticated software, according to Larry Banchero, documentation development manager. Writers work on Peachtree Software, Inc.'s Peachtext word processor with an interface to a Compugraphic Corp. 8400 typesetter.

An MSA report writer is used to assemble key pieces of technical documentation. The files become a data dictionary that is used for writing manuals.

In addition, writers can download technical information or actual screens off the system under development into Peachtext and then write the appropriate explanatory material, according to Banchero.

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WASHINGTON, D.C. — Attracting high-technology industry is the subject of two papers recently published by the U.S. Office of Technology Assessment.

"Technology, Innovation and Regional Economic Development Background Paper 1, Census of State Government Initiatives for High-Technology Development" examines 38 state programs intended to create, attract or retain high-technology companies. Technical manpower, business and financial assistance are among the initiatives discussed in the 80-page paper, available for $4.50.

"Background Paper 2, Encouraging High-Technology Development" discusses the roles state and local government, universities and the private sector have played in more than 16 high-technology development initiatives. The 108-page report, which lists each program and a contact person for each, costs $4.75.

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'Smart' decision fits company's spreadsheet needs



FIRST USER

By Paul Korzeniowski
CW Staff

TAYLOR, Mich. — Before Lotus Development Corp.'s Symphony and Ashton-Tate's Framework were announced, Masco, Inc. was evaluating another contender in the integrated software contest: Innovative Software, Inc.'s Smart Software series.

In November 1983, the conglomerate began testing the Smart series, which consists of a spreadsheet with graphics, word processing and data base management modules. The evaluation focused on the package's spreadsheet capabilities because Masco required a package that would allow its controllers to work first with financial data and then transmit it for consolidation on an IBM System/38 at corporate headquarters.

The search for a spreadsheet program began when the company became dissatisfied with Lotus's 1-2-3.

"Lotus's 1-2-3 was limited and did not meet our requirements," stated Preston Van Hanken, Masco's internal computer consultant. "We thought we would have to design our own program to meet our corporate needs."

A 1-2-3 limitation that Van Hanken listed was its inability to allow users to work with multiple spreadsheets. "Our controllers wanted to load and look at four spreadsheets simultaneously," he said. "They couldn't do that with the existing packages."

Masco's IBM Personal Computers each have 256K bytes of random-access memory (RAM), which presented another problem. "I worked with 1-2-3 for eight or nine months and was constantly running out of space," said Patrick Brennan, a Masco controller.

Lotus's 1-2-3 curse was Smart's blessing: Smart's modules require 256K bytes of memory, but since the modules operate with virtual memory, they are limited by memory on a diskette rather than RAM housed in internal memory.

While the ability to work within 256K bytes of memory was important, a critical benefit that Smart offered was its project files. These files work as templates and allow a user to tailor a program to his needs.

With the program files, Van Hanken's department designed 11 general ledger templates required in a number of corporate financial reports.

In addition to Van Hanken's templates, Brennan designed templates that are required in his office. "A major benefit is that we no longer have to wait for the data processing department to write the application," he noted.

While the Smart series is billed as a complete integrated package, it lacks a communications module, which Masco needed to transmit data from its branch offices to corporate headquarters. "We are using [Microstuf, Inc.'s] Crosstalk to transmit data," Van Hanken said. "Even if Innovative adds a communications module, I doubt we would switch to it." We are satisfied with Crosstalk and have invested too much in training."

Masco has barely scratched the surface of integrating data between the word processing, data base and spreadsheet modules.

One problem with Smart is that the modules are stored on 11 diskettes. "It is time-consuming running the product on floppy diskettes," Van Hanken noted. "It also takes five seconds to move data from one application to another application." Speed was another Smart shortcoming that Brennan noted. "There are some functions that execute more slowly than they would with 1-2-3," he stated.

Brennan said that Smart's Help screens could contain added detailed information and that the tutorial was incomplete.

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CUSTOMER COMMENTS

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JOHNSTON from page 1

bookkeeper in 1963. The NCR representatives were impressed with how Johnston had made certain processes more efficient, and they offered her a job.

A native of Meriden, Conn., and the mother of two sons and a daughter, Johnston married soon after high school and never attended college. "I had to go to work because I got divorced and had to support my kids," she said in a recent interview.

After hiring her from the bank, NCR sent Johnston to several of its own schools to learn what is now called requirements analysis. "They wanted me to analyze bank migrations from electromechanical processing to electronic data processing," Johnston said. After five years of being responsible for a geographic area centered around Meriden, Johnston decided she needed a job with less traveling. "It came time that I had to decide what came first. My kids needed me to be around, and I was the parent." NCR management supported her job search, she said.

A Hartford employment agency presented her with options that included Travelers. A visit to the company and "the people I talked to and the way they operated" convinced her to work for Travelers. What's more, "I felt the company didn't care if I was a woman or a man," Johnston said. She noted there was only one other woman in the department at the time, which was then the Life, Accident and Health Department, since DP was not big enough at Travelers in 1967 to merit its own department.

Johnston said she was also struck by the DP direction of Travelers at the time. "Travelers was developing and planning an advanced system, a totally integrated system, to be implemented five years down the road. In the DP world at that time, this was a tremendous thrust. Many people in DP at that time had no top-down view. They were busy automating a piece of paper, not the flow of that piece of paper," Johnston said.



The company was then using IBM 360, RCA 501 and Burroughs Corp. mainframes. Today, Travelers runs two IBM 3083s, one 3033 and 16 3084 mainframes as well as 6,000 IBM Personal Computers in its home, field and agent offices. The company is projecting that 25,000 personal computers will be in use by 1990.

Johnston began as a programmer at Travelers, developing systems in what is now called the Management Information Systems Division, where, she said, applications programmers and analysts design the "battleship" programs for the company.

Systems that Johnston helped to implement include the company's Comprehensive Automobile Real-Time System (Cars) for issuing, rating and reviewing automobile policies. The system replaced the Automobile Real-Time System (Arts), which ran on a Sperry Corp. Univac 494.

Just before Cars was to be implemented, Johnston went through her most unforgettable experience as a programmer at Travelers. The program had been fully tested and was ready to go by the deadline when, unexpectedly, the Massachusetts commissioner of insurance announced changes in formulas on how rates would be calculated in that state. The completed Cars program had to be reanalyzed, redesigned, recoded and retested. Management granted a three-month deadline extension. "We probably had eight people going around-the-clock to take advantage of the off-shift testing to really push that thing through — and we made it," Johnston said.

Another major project gave Johnston experience with training. In 1979, she was charged with managing an IBM computer-based training product called Interactive Instruction Systems for Travelers. The initial students were field office personnel who were learning how to use mainframes. One result of the program was to cut the error rate usually associated with new screens, Johnston said.

From her start as a programmer developing systems to her latest job of acting as a liaison with end users as system manager of the Travelers' Computer Store, Johnston seems to have completed a cycle. How does she view her role in the DP organization now? "I see myself as being in the front room of the DP shop," she said, "with computer science, the data center, communications and general operations behind me."

Has being a woman made a difference in her career? "The answer is that there is equal opportunity, if you're qualified," she said with no hesitation, adding, "We don't carry any deadwood."

How has DP changed, in the opinion of the 21-year veteran? Relating it to Travelers, she said, "Many places are driven by technology. You may have the greatest machine, but may be using only one-tenth of it. Over the past eight to 10 years, we've somehow directed ourselves to grab all that functionality and put it to proper use." At one time, "we got new stuff because it was new, and we always filled it up," she recalled, with a trace of doubt as to the wisdom of that course.

Guide International, the IBM users group, is a "tremendous help" to Johnston in her job, primarily because of the contacts it affords her. Such contacts "have saved a lot of lapsed time between question and answer" on her job, she said.

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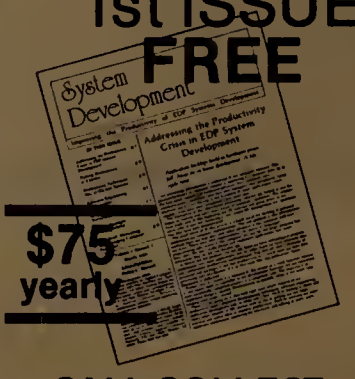
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Cullinet

Post-Installation Report

No. 016473

COMPANY

City University of New York
555 West 57th Street
New York, NY 10019

SITE IF DIFFERENT

SAME

PRODUCTS	DATE	INSTALLATION	PRODUCTS ACCEPTED
IDMS/R	1/23 - 1/25/84	✓	✓
IDB	1/25 - 1/26/84	✓	✓
GOLDENGATE	1/25 - 1/26/84	✓	✓

CUSTOMER COMMENTS

The City University of New York, the third largest University system in the country, has been actively pursuing a policy of developing integrated management systems for the University's personnel, student/course records, finance and budgeting areas. The success of this policy requires the establishment of a fully integrated software and hardware environment, of which the full complement of Cullinet software has become an integral part. After testing IDMS/R, the University became convinced of the product's superiority over previously used data base software, especially as it impacts our application programming productivity.

Date 1/31/84

Signature Bruce Danda

NEWS

WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

Bill introduced to overturn ATM as bank branch decision

WASHINGTON, D.C. — Sen. Paul Trible (R-Va.) recently introduced legislation to overturn a federal court decision that, he stated, could severely disrupt existing networks of shared automated teller machines (ATM).

The measure was prompted by a federal district court ruling in April that any ATM used by customers of a national bank is a branch of that bank, even when the ATM is owned by a third party, such as a supermarket [CW, April 23].

The ruling jeopardizes shared ATM networks, Trible said, because many states forbid or severely restrict branch offices from out-of-state banks.

His bill, the Banking Convenience Act (S. 2898), would ratify the U.S. comptroller's rule that only an ATM owned or rented by a bank is a branch bank.

An aide to Trible said hearings on the bill will be held Sept. 19-20, but further legislative action is not likely until next year.

Airlines required to disclose reservation systems data

WASHINGTON, D.C. — The Civil Aeronautics Board (CAB) recently announced that airlines must disclose certain details about the operation of their computerized airline reservation systems to help travel agents and other users monitor the fairness of the systems.

The announcement followed a recent CAB ruling that reservation systems owned by an airline must not favor the sponsoring airline's travel schedules, a practice called display bias, and must not engage in other discriminatory practices [CW, Aug. 6].

Upon request, the CAB said, airlines operating the reservation systems must disclose the criteria they use for constructing flight displays and the fees that airlines pay for listings and provide marketing data from the reservation systems to other airlines.

USDA to automate selection process for overseas work

WASHINGTON, D.C. — In response to international requests for U.S. agricultural experts, the U.S. Department of Agriculture (USDA) plans to establish a data base called the Automated Skills Inventory System to help select specialists for overseas assignments.

According to Charles H. Cook, acting assistant administrator for the USDA's office of international cooperation and development, the USDA expects to collect about 10,000 applications from specialists in the biological sciences. The applicants, once entered into the data base, will then be readily accessible for assignment.

If approved, the data base will be ready for use by Jan. 1.

How Charles E. Ames Made The Micro To Mainframe Connection



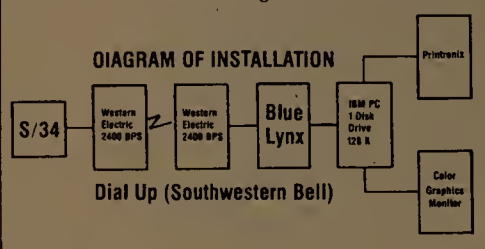
You'd be hard pressed to find someone who keeps up with IBM's smaller systems better than Charles E. Ames does. He's president and editor of **Basic Society News**, an independent journal devoted to the subject.

When Charles found out about BLUE LYNX™ 5251 terminal emulation for the IBM Personal Computer, he saw an immediate answer for a pressing need.

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DIAGRAM OF INSTALLATION



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TELECOM BRIEFS
By Phil Hirsch
CW Washington Bureau

Justice nixes Nynex, Ameritech proposals

WASHINGTON, D.C. — The Justice Department has turned thumbs down on a proposal by Ameritech, Inc. to offer shared tenant services and on another by Nynex Corp. to market regulated and unregulated services jointly.

Comments from the affected regional telephone holding companies are likely to be submitted this week, after which U. S. District Court Judge Harold Greene will issue a final decision.

The Justice Department opposed Ameritech's request because it would allow the company to market inter-Local Access and Transport Areas communications services, services specifically banned by the agreement settling the federal government's antitrust case against AT&T, according to a Justice spokesman.

The Nynex proposal, according to the Justice Department, would give the company an unfair advantage, since the joint marketing would be done by a subsidiary, Nynex Business Information Services Co.

One question raised by the Justice Department's recommendation is whether it conflicts with a recent Federal Communications Commission ruling. The commission has decided that the divested Bell operating companies could appoint agents to sell their regulated products and services, and that the unregulated affiliate of a local operating company can be an agent, provided outsiders are offered the same terms.

FCC calls for changes in pending AT&T tariffs

WASHINGTON, D.C. — AT&T will have to make several changes in its pending switched-digital, special construction and satellite services tariffs before the commission will allow them to become effective, the Federal Communications Commission said late last month.

These three tariffs — along with five others covering MTS/Wats, private-line and radio/TV transmission facilities — were filed several months ago to reflect the commission's new access-charge plan and the altered industry structure created by the breakup of the old Bell system.

On Aug. 29, the commission released an order detailing tariff changes that would revise present rates and terms for switched digital, special construction and satellite services. Another order, covering the remaining two tariffs, is pending.

In one of several criticisms leveled at AT&T's revised "Accunet Reserved" switched-digital service, the commission said AT&T appears to require use of AT&T-provided access lines. The commission added that "such a restriction must be justified or eliminated."

The commission also said the special construction tariff "allows AT&T too much discretion to refuse . . . service to a customer," and said the revised "Skynet" service includes a "satellite premises channel" that can be used only with AT&T facilities.

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201C modem		543
LDSU Asynch		220
LDSU Synch.		499
6001 4 ch. mux		1,110
6001 4 ch. w/4800		2,099
6001 8ch. mux		1,710

DIABLO

620SPI	NEW	700
630KSR	NEW	2,375
630API	NEW	1,555
630ECS-IBM	NEW	1,753
630RO-ECS	NEW	1,885
1640-1	used	800
1650	used	900

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keybd PC1K1-AA		169
monitor VR201-A		221
64K ex. mem. PC1XX-AA		337
Op/Sys QV065A3		105

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LA100BA	NEW	1,499
LA100RA	NEW	949
VT100	NEW	1,345
VT100	used	700
LA 34AA	used	350
LS120	used	850
VT101	used	600
VT102	NEW	1,075
VT131	NEW	1,150
LA12A	NEW	1,220
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AJ 243	used	65
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TI-745	used	350
TI-765	used	600
TI 810-100	used	500
GE 2120 KSR	used	750
Ventel 103	used	50
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Cullinet

Post-Installation Report

No. 019476

COMPANY	SITE IF DIFFERENT
METROPOLITAN LIFE INSURANCE COMPANY One Madison Avenue New York, New York 10010	Same

PRODUCTS	DATE	INSTALLATION	PRODUCTS ACCEPTED
IDMS/R	2/27-3/1/84	✓	✓
IDB	3/13/84	✓	✓
GOLDENGATE	3/13/84	✓	✓

CUSTOMER COMMENTS

METROPOLITAN is very interested in the capabilities offered by IDMS/R, IDB and GOLDENGATE. A definite need for such capabilites exists now and will increase in the future.

3/20/84
Date

Bruce Davis
Signature

Demand for 32-bit workstations outgrowing supply

PRODUCT SPOTLIGHT

By Tom Henkel
CW Staff

Sometimes called the engineer's personal computer, 32-bit workstations have become a hot commodity. Used primarily to fill the voracious processing needs of engineering, computer-aided design and manufacturing and graphics applications, 32-bit workstations are enjoying a period of marketplace demand reminiscent of the early boom period for desktop microcomputers. There seems to be a stronger demand for systems than there are vendors to supply products.

Roughly 30 companies currently manufacture 32-bit workstations, but more seem to enter the market each week. Last week, for example, Celerity Computing, based in San Diego, unveiled the C1200, a workstation that the vendor claims offers up to twice the performance of some of the largest superminicomputers.

While some large companies, such as Data General Corp. and Digital Equipment Corp., have jumped into the fray, the lion's share of the competitors are small start-up firms, some so small they use telephone answering services instead of corporate offices.

The approaches taken to developing 32-bit workstations appear to take three distinct tracks:

■ Larger companies like DEC, DG and Apollo Computer, Inc. build their own workstations. DEC,

See **32-BIT** page 18

A SAMPLING OF VENDORS OF 32-BIT WORKSTATIONS

Vendor	Product	CPU(s)	Operating System(s)	Networking Capabilities	Price Range
Apollo Computer, Inc. 330 Billerica Road Chelmsford, Mass. 01824	DN 300 DN 320 DN 550 DN 460 DN 660	Proprietary (DN 460, DN 660) or Motorola, Inc. 68010	Aegis Aux (Unix)	Tektronix, Inc. 4014 Domain Ethernet 3270, Hasp	$15,900 to $80,000
Cadmus Systems Co. 600 Suffolk St. Lowell, Mass. 01854	9750 9790	Motorola 68010	Unix	Ethernet TCP/IP Unison	$16,000 to $25,000
Cadnetix Corp. 5757 Central Ave. Boulder, Colo. 80301	CDX-5000 CDX-9000	Motorola 68010	Proprietary	Ethernet	$59,500 to $74,500 (CDX-5000) $27,000 to $63,000 (CDX-9000)
Celerity Computing 9692 Via Excelencia San Diego, Calif. 92126	C1200	Proprietary (Based on an NCR Corp. 32- bit chip set)	Celerity (Unix)	Ethernet Acccelnet TCP/IP Telenet	$45,000 to $72,600
Daisy Systems Corp. 139 Kaiser Court Sunnyvale, Calif. 94086	Chipmaster	Intel Corp. 8286	Maestro (Unix)	Ethernet	$120,000 to $160,000
Data General Corp. 4400 Computer Drive Westboro, Mass. 01580	DS/4000 DS/4200 GW/4000 GW/8000 GW/10000	MV/4000SC MV/4000 MV/8000 MV/10000	Unix AOS/VS AOS/RT32	IEEE 8023 Ethernet Xodiac SNA/SDLC	$35,000 to $345,000
Digital Equipment Corp. 146 Main St. Maynard, Mass. 01754	Microvax-1	Proprietary	MicroVMS Ultrix (Unix) VAX ELN	Ethernet Decnet	$10,000 to $25,000
Gould, Inc. 6901 West Sunrise Blvd. Fort Lauderdale, Fla. 33313	PS/3100 PS/5100	Megaframe[2] Concept/32	UTX/32 (Unix)	Ethernet	$69,900 to $120,000 (PS/3100) $115,000 to $165,000 (PS/5100)
Masscomp Co. One Technology Park Westford, Mass. 01886	Workstation-500	Motorola 68010	Unix	Ethernet	$22,500 to $75,000
Metheus-CV, Inc. P.O. Box 959 5510 N.E. Elan Pkwy. Hillsboro, Ore. 97124	Metheus[3] Lambda	Motorola 68010	Unix	Ethernet RS-232	$40,000 to $89,950
Orcatech, Inc. 1000 Morrison Drive Ottawa, Ont., Canada K2H 8K7	Orca 3000 Orca 3050	Motorola 68000, 68010	Unix	Ethernet RS-232	$28,500 to $58,500
Perq Systems Corp. 2600 Liberty Ave. Pittsburgh, Pa. 15330	Perq	Proprietary	Accent[4]	Ethernet	$25,000 to $35,000
Prime Computer, Inc. Prime Park Natick, Mass. 01760	PW200	Series 50 2250	Primos	Primenet Ringnet	$61,000 to $100,000
Ridge Computers, Inc. 2451 Mission College Blvd. Santa Clara, Calif. 95054	Ridge 32S Ridge 32C	Proprietary	Unix	Ethernet TCP/IP	$36,400 to $90,000
Sun Microsystems, Inc. 2550 Garcia Ave. Mountain View, Calif. 94043	Sun-2/120 Sun-2/170	Motorola 68010	Unix	Ethernet Arpanet Telenet	$26,000 to $50,000
Syte, Inc. 1139 Sorrento Valley Road San Diego, Calif. 92121	Series 3000	National Semiconductor Corp. 32000	Unisyte (Unix) Smalltalk	Ethernet Sytenet TCP/IP	$30,000 to $100,000
Telesis Corp. 21 Alpha Road Chelmsford, Mass. 01824	T-Series	DEC LSI-11/73 Motorola 68000 NEC Information Systems, Inc. 7220	RSX-11M	Ethernet	$78,500 to $100,000
Valid Logic, Inc. 2820 Orchard Pkwy. San Jose, Calif. 95134	Scaldstar Scaldsystem 1 Scaldsystem 2 Scaldsystem 4	Motorola 68000	Unix	Ethernet	$20,000 to $100,000
Via Systems, Inc. 76 Treble Cove Road North Billerica, Mass. 01862	Worknode50 Systemnode200 Servernode250	Motorola 68010	Unix	Ethernet	$29,900 to $89,900

1. A sampling of vendors offering 32-bit workstations. This listing was based on several industry analysts' opinions of the leading players in the 32-bit workstation marketplace. It is not intended to be an exhaustive listing.
2. Manufactured by Convergent Technologies, Inc.
3. Available in three turnkey configurations for custom design, logic design and schematic design applications.
4. Developed as part of a research project at Carnegie-Mellon University.

CW CHART

Steps to success in CAD/CAM

In a recent report covering the computer-aided design and manufacturing (CAD/CAM) marketplace, New York-based Frost & Sullivan, Inc. outlined the basic requirements a company must fulfill to compete successfully.

Hardware must include the following:

■ An intelligent workstation with stand-alone and application oriented optional features.

■ Networking capabilities to access and share other resources.

■ Accessible CPU power for modeling, analysis and data base management features.

■ Storage capabilities for active, backup and archival needs, including computer-aided retrieval systems.

■ Plotting and printing capabilities for monochrome and color hard copy.

From a software standpoint, Frost & Sullivan said the successful firm must offer the following:

■ A standard operating system and utilities.

■ Generic software for applications, such as drafting and modeling, as well as industry-specific software packages, such as for electrical and mechanical design markets.

■ The ability to integrate tasks within functions and between functions.

■ Data base management capabilities for generic applications as well as a capability to meet corporate requirements, such as a distributed processing environment.

■ An accessibility to any other software written by the supplier, the user or a third party.

■ The ability to exchange capabilities with other suppliers' equipment.

From a service standpoint, the successful supplier must be able to do the following:

■ Provide sufficient maintenance to guarantee the user sufficient uptime.

■ Train users before and after the systems are installed.

■ Debug and upgrade services.

■ Be able to develop specialized products on a contract basis.

■ Provide consulting services.

The Frost & Sullivan report No. A1030 is called "The CAD/CAM Market 1982-1988." It costs $1,500 and is available from the company at 106 Fulton St., New York, N.Y. 10038.

The solution is complete for CSWS.

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UNISCO Business Forms - 8

Cullinet

Post-Installation Report

No. 007249

COMPANY	SITE IF DIFFERENT
CENTRAL & SOUTHWEST SERVICES (CSWS) 2121 SAN JACINTO STREET DALLAS, TEXAS 75222	SAME

PRODUCTS	DATE	INSTALLATION	PRODUCTS ACCEPTED
IDMS/R	1/23-1/25/84	✓	✓
IDB	1/24-1/25/84	✓	✓
GOLDENGATE	1/24-1/25/84	✓	✓

CUSTOMER COMMENTS

THE TOOLS DEVELOPED BY CULLINET (SUCH AS GOLDENGATE ON THE PC AND ADSO ON THE MAINFRAME) HAVE CAUSED THE COMMUNICATION GAP TO BE BRIDGED -- NOT ONLY FROM A DATA TRANSFER ASPECT, BUT MORE IMPORTANTLY FOR VERBAL AND VISUAL INTERFACE. NOW SYSTEMS DEVELOPMENT IS A JOINT PROJECT -- NOT A USER STATING A NEED AND BEING GIVEN A "BLACK BOX", BUT A COORDINATED INTERFACE BETWEEN NEEDS AND TOOLS THAT ARE HIGHLY ADAPTABLE TO THE CHANGING ENVIRONMENT OF PROTOTYPE DEVELOPMENT.

1/30/84
Date

Sharon Salathiel
Signature

32-BIT from page 16

for example, developed a scaled-down version of its VAX-11 CPU in the Microvax-1. Since January, DG has unveiled several stand-alone workstations based on its MV line of 32-bit superminicomputers. Apollo Computer, one of the pioneers in the market, developed proprietary CPUs for its upper end products, but relies on industry-standard microprocessors for its low-end line.

■ Other vendors, such GE Calma Co., Silvar Lisco, Inc. and CAE, Inc., use a CPU developed by Apollo. Some vendors have developed products using DEC's VAX line as a base. These vendors buy the CPU and add specialized software to make a unique product.

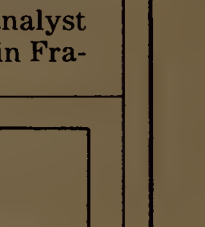
■ Most of the smaller start-up companies use what appears to be a standard formula for workstation products. Many have been designed around the Motorola, Inc. 68010 microprocessor, offer the Unix operating system and support the Ethernet local-area network.

Reason for look-alikes

The reason for so many look-alike products, noted Norm Weiser, a senior analyst with Cambridge, Mass.-based Arthur D. Little, Inc., is that 32-bit workstations are relatively easy to build. Wholesale venture capital for start-up, high-tech companies does not flow as freely as it did five years ago, and entrepreneurs are forced to keep start-up costs down.

One solution to that problem is to design systems around off-the-shelf components. Howard Dicken, president of DM Data, Inc. in Scottsdale, Ariz., noted that an entrepreneur can break into the 32-bit workstation market with little more than an electrical engineering degree and a team of relatively low-paid assembly personnel.

Stand-alone, 32-bit workstations have become popular because many companies view the units as productivity tools for highly paid engineers. If a $30,000 to $50,000 workstation can significantly boost the productivity of a design engineer making $60,000 to $80,000 annually, in the long run, the company saves money. Furthermore, DM Data's Dicken noted, many recent engineering graduates have been raised on computer-aided graphics and engineering functions to the point where they demand access to computer resources as a condition of employment.



Dicken, and other industry watchers, agreed that the demand for 32-bit workstations is, and will remain, strong throughout the decade largely because there appears to be a bottomless supply of engineers graduating from colleges and universities.

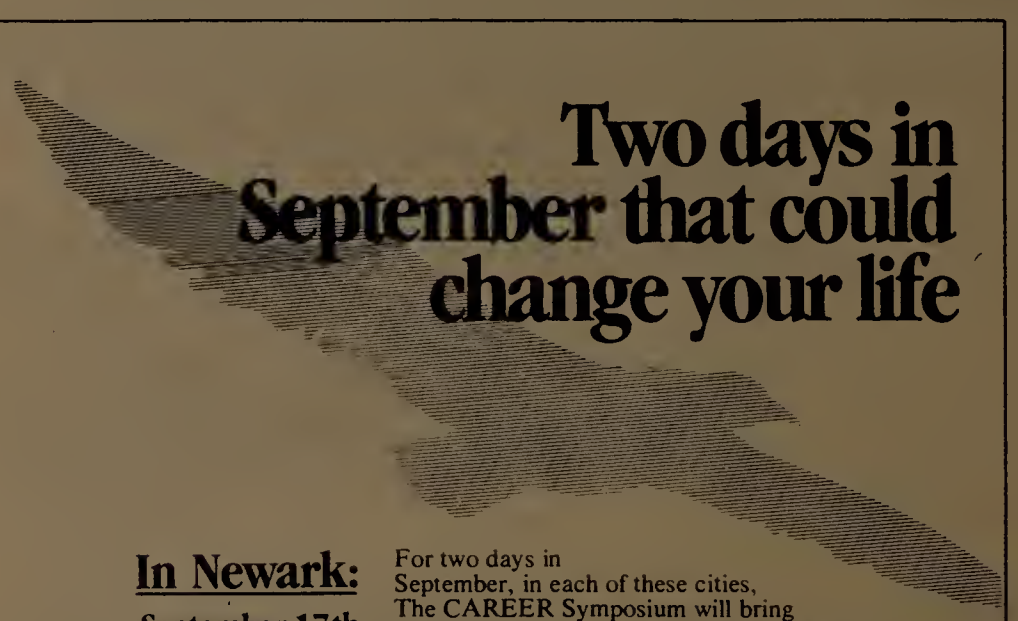
But in spite of the strong demand for workstations, it is questionable whether there is enough business to support an unlimited number of vendors.

The factors that will contribute to a company's long-term success or failure appear to be twofold. On one hand, Adam Zais, a senior analyst with International Data Corp. in Framingham, Mass., contended that the custom applications software usually marketed along with 32-bit workstations will become an increasingly important factor as the workstation marketplace tightens up. Zais contended that the hardware in this marketplace is a consideration secondary to the capabilities of the software.

DM Data's Dicken, however, noted that for perhaps the first time in the high-tech business, a 32-bit workstation vendor's marketing approach may prove more significant than the actual product. Dicken compared the 32-bit workstation marketplace to the cereal aisle in the local supermarket: Since many of the boxes contain basically the same product, the appeal comes from the size and the color of the box and the advertising campaign launched by the manufacturer.

A name noticeably lacking from a discussion of 32-bit workstations is IBM. Just as the emerging microcomputer industry was transformed by IBM's announcement of its Personal Computer line, the announcement of a 32-bit workstation by IBM could change all the current rules of the marketplace overnight.

So far, IBM appears to have skirted the 32-bit workstation issue with products like the 3270 Personal Computer (which analysts say is too slow for serious engineering work) and the recently announced Personal Computer AT, which appears to hold potential for an engineering audience. But so far, IBM has yet to announce a product that goes head-to-head with powerful workstations such as DG's GW/1000.



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UNICO Business Forms - 8

Cullinet

Post-Installation Report

No. 026883

COMPANY	SITE IF DIFFERENT
Harris Corporation 1025 W. NASA Boulevard Melbourne, FL 32919	Same

PRODUCTS	DATE	INSTALLATION	PRODUCTS ACCEPTED
IDMS/R	2/27 - 3/1	✓	✓
IDB	3/12	✓	✓
GOLDENGATE	3/12	✓	✓

CUSTOMER COMMENTS

These new tools open great new possibilities for business application systems.

3/19/84
Date

David Roos
Signature

NEWS

Bank develops info center to capitalize on micro investment

By John Desmond
CW Staff

BOSTON — One-half to three-quarters of the employees at Bank of America will be using microcomputers by 1990, the bank's product management group vice-president, Coby Dunn, told an audience at the Information Center Conference & Exposition here recently.

Bank of America has 84,000 employees, and it is in the midst of developing an information center to serve them, said Dunn, who is responsible for end-user computing at the bank. Currently, 240 employees at Bank of America work in end-user computing, which serves 10,000 users worldwide on a dial-up network.

The bank drew upon internal studies that showed the primary uses of the company's Interactive Computing Facility, its first time-sharing system, brought up 10 years ago. Those uses include:

- Decision support tasks, 36.6%.
- Major MIS tasks, 24.8%.
- Development, 18.8%.
- Production, 11.9%.
- Office automation, 5%.
- Utilities, 4%.

The bank has concluded that the developing information center should concentrate on delivering these services, Dunn said.

By 1990, the bank wants its information center to permit a majority of users to access its MIS data base, allowing worldwide access to data, 24 hours a day.

That goal could be affected by a number of issues, including the fact that diverse system approaches and hardware types are now in use, data is fragmented and the government-regulated business environment is changing rapidly. "Banks in the 1970s were very large batch processing environments, and we are becoming very large on-line processors," Dunn commented.

The bank concluded that fourth-generation programming was needed to provide an increase in productivity, reductions in the product development cycle, delivery of accurate and consistent management information and sufficient data resource management. "Fourth-generation languages are less efficient, but more economical in getting products into the market faster," Dunn said.

Bank of America is still formulating its policy toward the microcomputer revolution, Dunn said. Personal computer user requirements have been identified and include sharing the corporate data base, having a fully integrated inquiry and analysis ability and being capable of applications development without programming. "I don't want to take private bankers and turn them into [Lotus Development Corp.] jocks. I want them to be better private bankers," Dunn said.

The bank also decided to incorporate IBM's SQL into its information center operations, Dunn added. The bank further decided that its system should provide access to its National CSS Corp. Nomad II relational data base, which now contains 93,000 procedures, with an average length of 70 lines, Dunn said. "It's a slow maturing process," Dunn said of the bank's effort to bring up an information center.



FIG to meet Nov. 16-17

PALO ALTO, Calif. — The Forth Interest Group (FIG) will hold its sixth annual Forth Convention and banquet here Nov. 16-17 at the Hyatt Palo Alto.

The convention will focus on the latest developments and applications of the Forth language and will reportedly include exhibits, tutorials and seminars.

Preregistration is $10. On-site registration costs $15. FIG can be reached through P.O. Box 105, San Carlos, Calif. 94070.

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With all the publicity surrounding the relational features of IDMS/R, there is a Tendency to overlook the baseline products which brought IDMS to the place it is today. A series of benchmarks performed against IDMS/R and the current release 5.7 shows IDMS/R performing 25-35% faster in database services, ADS/O, OLQ, and Culprit. This kind of performance improvement is quite impressive.

2/3/84
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Speaker says info centers must prove their effectiveness

Suggests using market research techniques, chargeback to track benefits, services

By John Desmond
CW Staff

BOSTON — In a properly managed information center, objectives are clear and the center's benefits to users are closely tracked in order to prove the center's effectiveness to management, Ray Youstra of IBM advised an audience at the Information Center Conference & Exposition here recently.

The same type of tracking should also be employed in the start-up stage of information center development, because when a company wants to acquire 10,000 or more micros at cost of several thousand dollars each, management will want the cost justified, the marketing support representative said.

He credited the increasing capability of microcomputers with leading to the popularity of information centers, commenting that, "All of a sudden we can afford to run application packages we could never have run before."

The main objectives of the information center should be to provide tools for end users to access and analyze data needed to do their jobs, to provide consultation and training for end users to become self-sufficient, to provide guidance to corporate management on the proper use of end-user computing and to provide a catalyst for improvements in performance companywide, according to Youstra.

He said the information center should be run as a business within a business, complete with marketing, measurements and a board of directors. "You must report back to someone high up in the organization, not just the DP manager," Youstra said.

Individual performance evaluations have ample precedent and, Youstra said, should be used to track information center staff performance, but how does one track the performance of an information center?

"Common quandaries include a situation in which users want something that DP thinks is irrelevant, and some things DP thinks are relevant, the users don't care about," he said. In his view, the solution is to use techniques typically employed in market research.

Among Youstra's suggested techniques for tracking information center performance is an on-line questionnaire, which he said is easy for users to answer and can be directed to a selected subset of users.

He recommended that information center management and end users adopt a services agreement, detailing hours of service, expected response times and user responsibilities. "Any system can be built to give you subsecond response time — all it takes is money," Youstra said, advising that each business has to make its own decisions about the speed of its system.

Youstra is a strong proponent of the chargeback internal accounting method for tracking the use of an information center.

Such accountability is needed, he said, especially in view of predictions that spending on the centers will far outstrip spending on ordinary DP in coming years. "That's the thing that forces the measurement of end-user computing and gets it back to the company," he said of chargeback accounting.

'You must report back to someone high up in the organization, not just the DP manager,' — Ray Youstra, IBM

While DP managers often use quantitative measurements such as cost-benefit analyses to justify spending and because the DP center is often in a defensive position in organizations, Youstra suggested that qualitative benefits may be just as important.

He calls such intangible benefits "squishy" benefits, because "they're so hard to get a handle on." Youstra said such benefits include: work eliminated, return on time, improved decisions, competitive edge and quality of work life.

Citing a tangible benefit, Youstra said the DP shop should experience a change in the nature of its work — though not necessarily a reduced applications backlog — when an information center is properly run. Ad hoc application programming requests should begin to disappear, and the focus for the DP shop should shift to more intricate types of applications, Youstra said.

"In the information center, you want people coming in looking for new services," he said.

Lastly, Youstra encouraged the audience to "make sure progress changes your company" and that implementing an information center makes a measurable difference.



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DP departments must support end users, speaker says

By Edward Warner
CW Staff

BOSTON — Corporate information managers need to develop an overall strategy for dealing with the revolution brought about by end-user computing, a strategy that means support for users, not control. Without such a strategy, the corporation's data processing department could become irrelevant.


Bakshi

That assessment was made by Van Bakshi, an instructor with the IBM Information Systems Management Institute, during a presentation to about 200 at the recent Information Center Conference & Exposition here. Above all, Bakshi said, the data processing department must resist its "pathological need" to control end-user computing, even though it may feel its own destiny is threatened.

"In the formative stage of any new discipline, [one must] stay away from control," he said. "We have to change our control orientation to a service orientation."

Instead, Bakshi advised that information centers be formed and that they operate from a marketing perspective, looking on desktop computer users as clients. "Don't think of the information center as something just involved in installing terminals or helping with products," he urged.

For the information center to function well, he noted, it must be strategically placed in the corporate hierarchy to forsee and effect change. The data processing department, he warned, usually presents the biggest opposition to such a strategy and must be reassured that "we're here to help business, [too]." Should the data processing department refuse to acknowledge the importance of the shift to end-user computing, Bakshi said, then "the data processing [department] is going to be irrelevant."

'Strategic tool'

Already, he argued, data processing "doesn't realize what a strategic tool it has" in the power of end-user computing. The objective, he said, is for data processing to help the organization determine the strategic placement of its newfound desktop computing power.

As for the information center's staff itself, Bakshi said it is usually a diverse group of people — a situation that often makes for differences in pay levels — and that they should be part facilitator, part consultant and part educator. Currently, he noted, the average ratio of information center consultants to end users is about 1:35, with a ratio of 1:100 prevailing in the engineering world.

The information center's director, he added, cannot be an introvert — at least 50% of his time must be spent outside of his department marketing the center's services to the end users.

Speaker: Graphics worth a thousand words in business decisions

BOSTON — In addition to improving any company's bottom line, computer graphics is destined to replace "verbiage" by making decision makers more "visually literate."

So said Dr. Kathryn Lutz Alesandrini, president of Micro Connect, a computer graphics consulting and software company, which is based in Santa Monica, Calif. Alesandrini spoke before a packed house at last week's Information Center Conference & Exposition here.


Alesandrini

Alesandrini cautioned, however, that, "If you don't use graphics in the right way, you may do more harm than good by distracting people from important information."

To support her claims of graphics benefits, Alesandrini noted a Wharton Business School study that found graphics presentations were persuasive to decision makers 60% of the time, while verbal presentations were persuasive 50% of the time. The Wharton study also found that graphics shortened meetings by 28% and that graphics helped to promote a group consensus in 79% of presentations, compared with 58% of presentations without graphics.

Good computer graphics systems should be flexible, should allow multiple plotting on a page, should feature intelligent devices and machine independence and should allow slide previews on nongraphics terminals, Alesandrini advised.

She also labeled as a common misconception that computer graphics are only for artists and that a lot of numeric information cannot be visualized.

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Info center seen key to DP, end-user communication

By John Desmond
CW Staff

BOSTON — The key to understanding how to improve the relationship between end users and the DP department is to understand how houses are built and kitchens remodeled, according to David C. Mollen.


Mollen

A new application cannot be test-driven, because it does not exist before the user wants it, said Mollen, a senior staff member at IBM's New York Information Systems Management Institute. He spoke here recently at the Information Center Conference & Exposition.

"Is there any other product that doesn't exist before you buy it?" Mollen asked. The process of building a house and the process of designing an application both involve initiation, definition, architecture, design and fabrication, he said.

What, then, should the answer be when an end user asks how much it will cost to develop the program? According to Mollen, the correct response is: " 'The product has not been specified, and we don't know the price.' The trouble in DP is that we say 'yes' too often." Users have been spoiled as a result, he asserted.

"In DP, we believe it's our job to tell [end users] what they want, because in the end, that will be what they need," Mollen said. However, he suggested instead, "The probability of the product being what it should be is maximized if the user defines what he wants."

Mollen said when he remodeled his kitchen, the contractor was paid one-third when the contract was signed, one-third when the cabinets were delivered and one-third when they were installed. He said he spent 15 months deciding which cabinets he wanted before he signed a contract. "Change, sign, build — that's the key to success in DP. But you only see that when you talk about kitchens and houses," Mollen said.

Users, Mollen charged, have gone into information centers out of frustration with DP.

"What we do in DP is rush to a solution when we may not know what the problem is," Mollen said. He cited a $6.8 million software development project at an unnamed company where half the software was unusable, nearly one-quarter was not delivered and nearly one-quarter had to be abandoned. Only 1.75% of the software could actually be used, he explained, adding that no more than 4% of software developed in DP shops is really usable.

Mollen estimated that 50% of a programmer/analyst's time is spent on maintenance, 25% on testing, 17% on design and 8% on coding. The testing phase is too little of the whole, he said. Usually, after a program has been designed, coded, tested and delivered, the user says, ' "It's not right,' " he said.

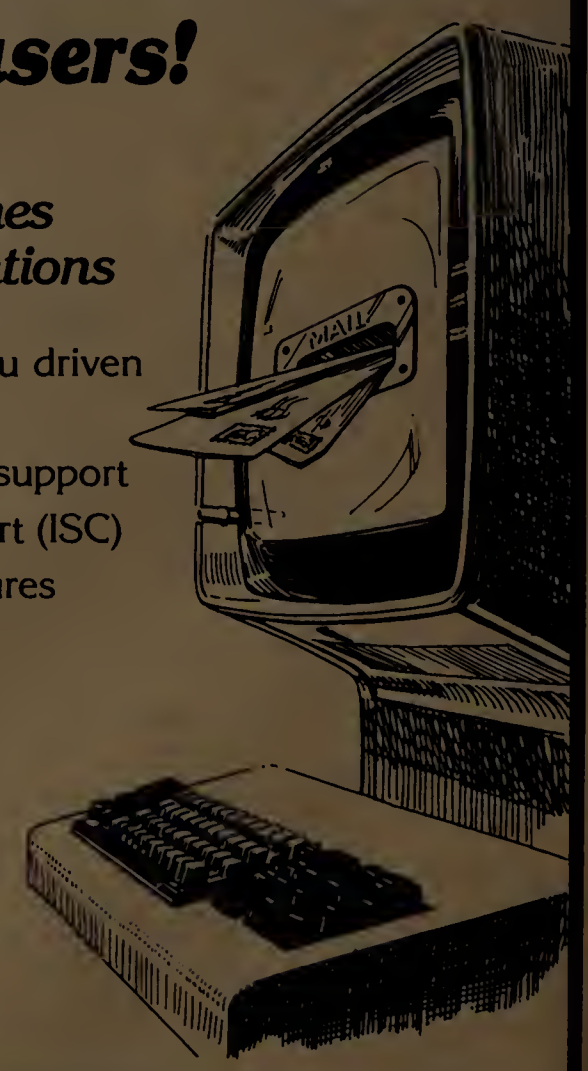
So how can communication with end users be improved? "There is no better idea than the information center because they begin to solve the problem of identifying user needs," Mollen said. Users should be involved in application development, because the users pay the costs of a program that does not work, he added.

He encouraged the DP managers to think of end users as customers. "Do things that will make people want to do business with you," Mollen said.

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NEWS

Louisiana enacts software law

By John Gallant
CW Staff

BATON ROUGE, La. — In what officials hailed as an important step toward curbing the growing problem of software piracy, Louisiana has become the first state to enact a so-called "shrink-wrap" licensing law.

The state's Software License Enforcement Act, which mandates that a consumer be bound by the specific terms of the manufacturer's license agreement if a software package is opened or used [CW, Feb. 27], was recently signed into law by Gov. Edwin W. Edwards.

Introduced in April by state Sen. William Atkins and state Rep. Al Ater, the legislation is intended to strengthen the ability of software publishers to enforce their rights under existing trade-secret and copyright laws.

According to First Assistant Secretary of State J. Robert Wooley, the legislation will make it clear to consumers of packaged software that license agreements included with the package will be enforced by the state. In the past, he said, state and federal courts have split on the issue of whether the package's license agreement constitutes a binding contractual arrangement with purchasers.

"In the area of mainframe or minicomputer software, the purchaser had to sign a licensing agreement with the manufacturer. But with the advent of mass-marketed software, it became necessary to include the contract in the packaging. The courts have been divided over whether the purchase or use of the software indicated an intent to become a licensee. This law makes it clear that such action does indeed constitute that intent within this state," Wooley said.

The law, which went into effect immediately after the governor's signing, provides no criminal penalties. Instead, it gives software manufacturers a civil, contractual claim against users who illegally copy or modify a package. Wooley said the law faced only token opposition in the state legislature.

According to W. Krag Brotby, the law will serve as a model for other state efforts to halt software piracy. Brotby is chairman of Vault Corp., a software security system maker that drafted the Louisiana legislation and served as its computer industry sponsor.

"It is important to note that the Louisiana effort did not meet with any serious opposition. The law was not opposed by either manufacturers or consumer groups. I think that indicates it is a good, flexible law. It won't end piracy, but it is a step toward cleaning up the problem. If more states had this type of legislation, we could have piracy pretty well under control," Brotby said.

Both Brotby and Wooley said legislators in Georgia are currently considering similar legislation. And, according to legislative aide Richard Steffen, Assemblyman Gray Davis (D-Los Angeles) plans to introduce in the California legislature his own version of the Vault-drafted bill.

Davis is expected to submit the proposed legislation — tentatively dubbed the Software Protection Act — to the state legislature in January.

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NEW YORK - The 4th edition of the 1984 Directory of Computer Installations, lists 16,000 computer users in NY, NJ & CT.
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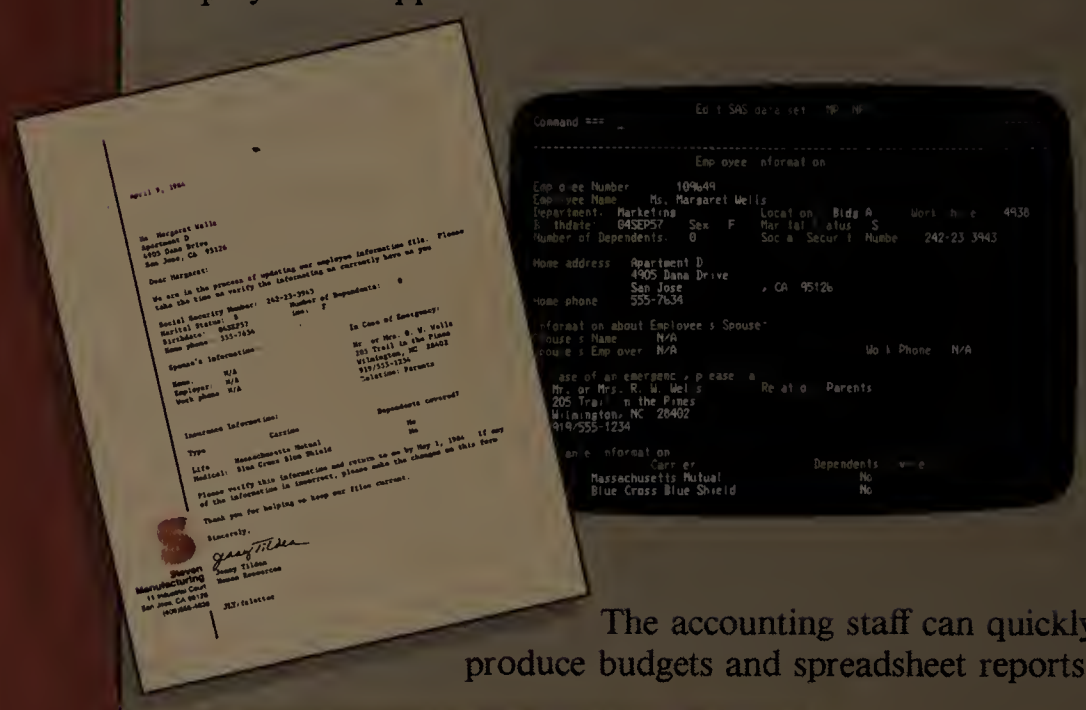
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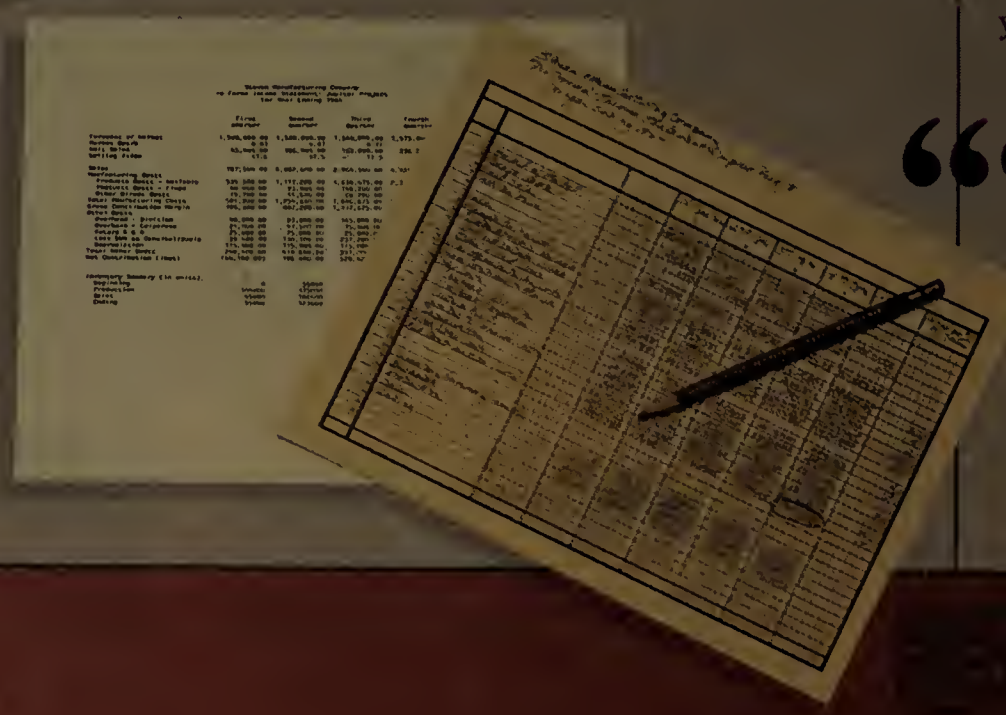
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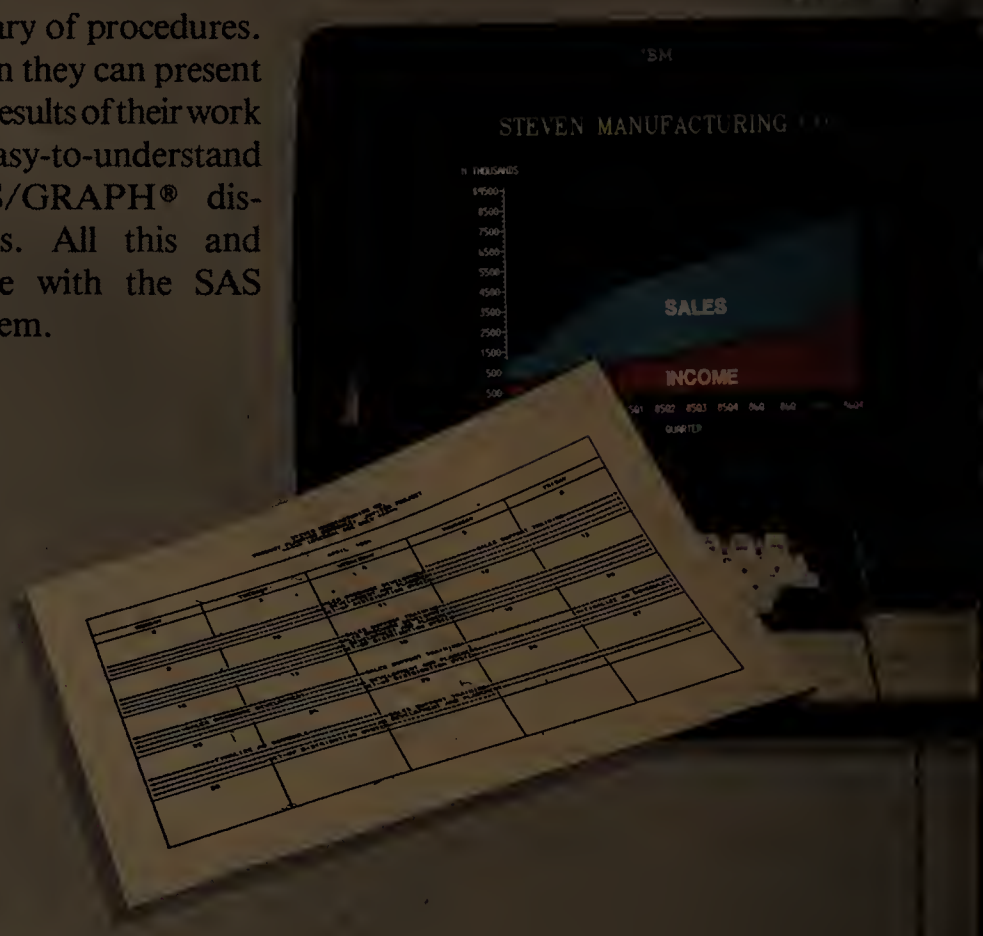
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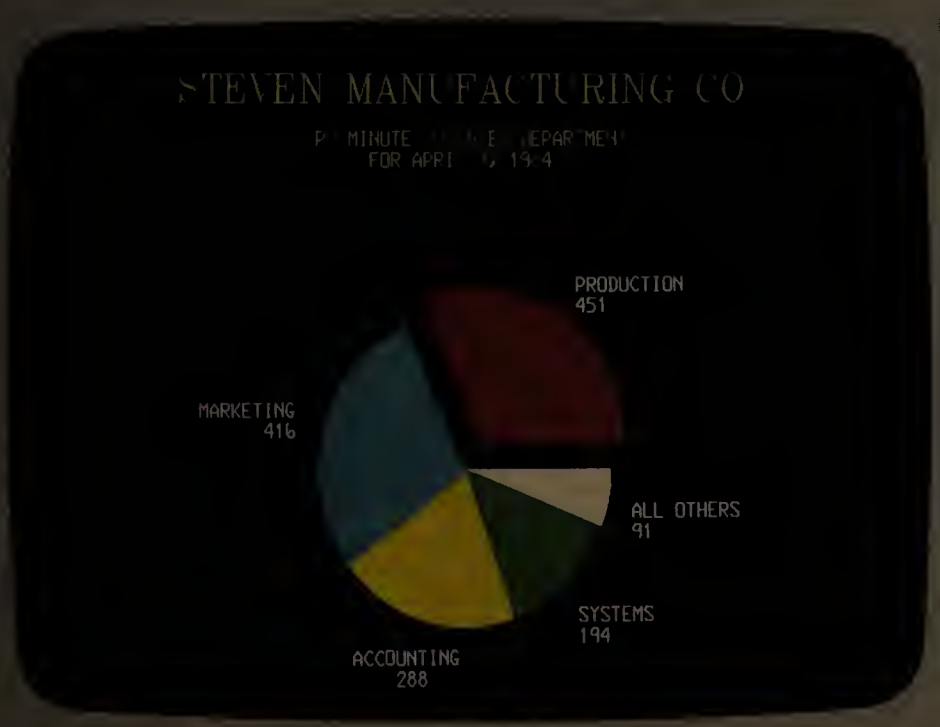
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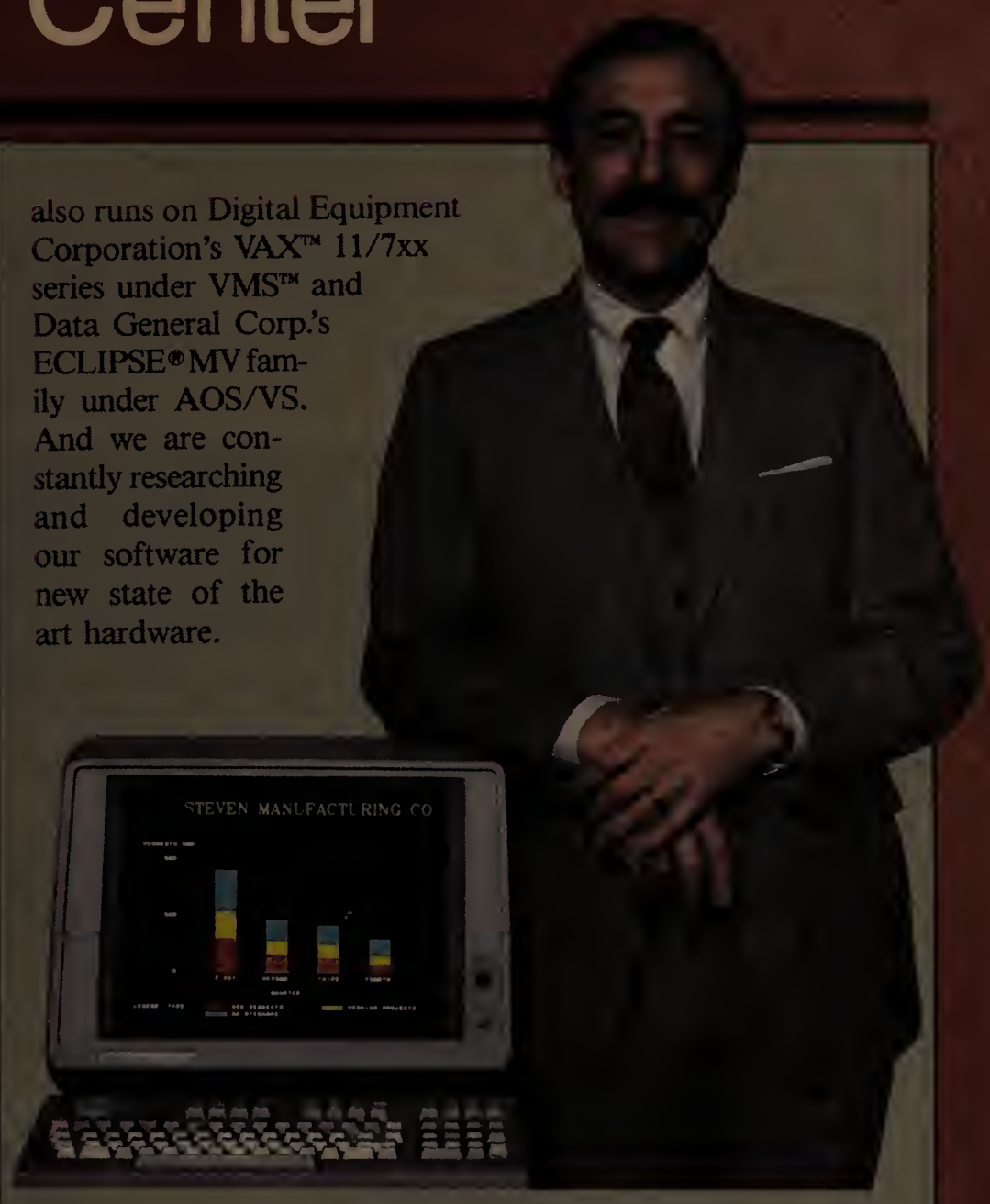
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FOR APRIL 9, 1984

		CPU MINUTE			I/O COUNT	
DEPARTMENT	JOBNAME	NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
ACCOUNTING	JACCT110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHER8	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHER8	18	31.00	1.72	50314	2795
LEGAL	OTHER8	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHER8	21	89.95	4.28	100880	4804
PLANNING	OTHER8	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHER8	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS820	4	26.62	6.15	39212	9803
	JSYS700	4	47.36	11.84	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHER8	17	33.88	1.99	114291	6723
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9/10

ABC covers conventions with mainframe-based, mobile DP setup

By James Connolly
CW Staff

DALLAS — What may be the only news operation relying on a mainframe enjoyed almost instant reponse times from its data center while working out of mobile trailers at political conventions here and in San Francisco, according to ABC officials.

"Every other news operation in [television], radio or newspapers is based primarily on microcomputers or minicomputers. IBM mainframes don't handle word processing as well as some of the minis and micros, so we have sacrificed there. But the real No. 1 thing that we wanted to solve was the task of letting producers around the world have the same access to information that someone in the same room with the mainframe would have," reported John Miller, director of data processing for ABC-TV news.

ABC's in-house-developed software does include what Miller described as a relatively simple word processing system for script writing. But the heart of the news data processing operation is the network's corporate IBM 3081 mainframe in Hackensack, N.J., used for administration and production, Miller said.

"If a story breaks right now, the assignment editors have to know which crews are available to send right now," said Miller in ABC's temporary newsroom in Dallas. He emphasized that assignment editors in Dallas, in the main New York newsroom, in the London bureau and in the 12 bureaus across the U.S. use the mainframe to track their film crews, correspondents and production schedules.

More than 200 terminals in the U.S. and London are linked to the 3081, using programs written by ABC Systems Manager Avi Woolf and 10 programmers who used APL and assembler languages. Miller said the staff has produced 20,000 lines of code in as little as six weeks.

Menu-driven software

The news operation's software is largely menu driven, with terminal operators keying in single letters that correspond to functions.

Demonstrating one program, Miller showed how an editor or producer can scan on-screen charts to determine where news crews are assigned for the day, what time the crew went on duty, what time they are scheduled to finish their assignment or their shift and in what hotel the crew is housed.

Another program was used by the news administration office to estimate the cost of convention coverage, considering personnel, communications costs, travel expenses and equipment costs, before most of the personnel arrived in the convention cities.

ABC officials in any bureau can view the production schedules for news shows.

The scheduling program lets producers define and move blocks of the schedule, previously written in pencil, so that anyone with a terminal knows that a correspondent's report has been delayed, advanced, canceled or added.

For the Democratic National Convention at San Francisco's Moscone Center in July and the Republican National Convention at the Dallas Convention Center last month, the network shipped west about 50 IBM 3278 Model 5 and IBM 3290 terminals, about 10 IBM 3268 printers and three IBM Personal Computers with IBM 3270 emulation packages. Miller said that the network is experimenting with the 3290 four-screen terminals, and that in the November elections, the terminals will be used to display 48 races at a time.

That equipment was installed in more than 20 office trailers, anchor booths and temporary offices spread throughout the convention halls and was linked by wire to IBM 3274 Model 61C controllers and Racal-Milgo, Inc. Omnimode modems. The net-

See **ABC** page 31

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Logging, storage, retrieval software pinpoints ABC news videotapes on file

DALLAS — When ABC-TV news officials at the Republican National Convention needed videotape from ABC's 330,000-cassette library, their IBM mainframe took less than five seconds to tell them how many tapes pertained to their subject, even a 21-year-old subject such as President John F. Kennedy's assassination.

By keying in a reference and a series of cross-references, a producer working in a mobile trailer at the Dallas Convention Center could find, in minutes, where a specific segment of tape was stored.

ABC relies on its IBM 3081 mainframe, running IBM's Storage and Information Retrieval System (Stairs) to track down videotapes shot a few hours ago or several decades ago.

"A person with a normal degree of research intelligence can narrow down a search of 330,000 documents and get one piece of film," said Michael Brajczewski, project manager for ABC's information systems department.

Arnold Snyder, manager of the Film/Videocassette Library for ABC, noted that the network computerized its files in 1978 by having an outside firm keypunch information from 80,000 index cards.

At the same time, ABC began logging its tapes according to subjects and personalities. Last year, it added the time the subject appears on the tape by using an in-house logging system that matches the tape machine's time to the computer time.

At both the Republican and Democratic conventions this year, ABC cameramen turned in more than 200 videotape cassettes, which were logged by local college students working at video monitors and IBM 3278 terminals.

In addition to the on-line log, the system produced multicopy paper printouts of each log, several for distribution to tape editors and one for insertion in the cassette box.

"The only problem we've had is that the technology is catching up to us," Brajczewski noted. He said that while the printouts fit easily in the standard ½-in. cassette case, a cameraman in Dallas was the first to file tape on a ¼-in. cassette. He said the printouts are far too large for that cassette. That leaves the library wondering how to store the printouts.



Student logs videotapes at Republican National Convention.

ABC from page 30

work maintained three 9,600 bit/sec dedicated lines to its Hackensack, N.J., data center and six backup, dial-up lines.

One program that ABC did not use in Dallas, but that was crucial in San Francisco, was a data base of delegates. That system, using data acquired through preconvention questionnaires and telephone interviews with delegates, gave the network information about the delegates.

That data base system let producers and correspondents compare actual votes to anticipated votes and to isolate particular types of delegates for interviews.



System allows on-line scrutiny of campaign finances

WASHINGTON, D.C. — During this 1984 election season, the public outside the nation's capital can use on-line computer terminals to tap into the Federal Election Commission's (FEC) huge data base of election campaign reports, thanks to a pilot project establishing a remote access system in several state offices.

Already, terminals with access to FEC records are in place in state election offices at Atlanta, Chicago and Denver; in addition, terminals will soon be installed in Los Angeles, Sacramento, Calif., and Boston, officials said.

The system permits reporters, candidates, lobbyists and other interested parties to see FEC reports on the receipts and disbursements of candidates and political committees in federal elections. "It's an effort by the commission to make the FEC data available throughout the country, outside of Washington, D.C.," said Richard Hooper, an FEC supervisory systems analyst.

In the test program, the FEC pays the computer and telecommunications costs while state election officials provide the access terminals. The commission budgeted $40,000 for the pilot program to cover telecommunications costs and travel costs for sending FEC staff to train state officials, according to FEC spokesman Fred S. Eiland.

Hooper explained that the on-line terminals communicate with a Digital Equipment Corp. Decsystem-10 mainframe operated by the FEC's data services contractor, National Data Corp., in Fairfield, N.J. The contractor makes a copy of the FEC data base for the remote access system when the data base is updated each night.

Because remote users have access only to these duplicate files and can retrieve only the data indexed by the on-screen menu, Hooper said, the dedicated FEC data base is not degraded by the remote system, and the integrity of the data base is protected.

The state offices have selected a variety of terminals for the access system, according to election officials at each of the three existing sites. The Chicago office of the Illinois Board of Elections has a Televideo Systems, Inc., 920 terminal and a DEC Letterwriter 100; the Colorado Secretary of State's office has a Letterwriter 100; and the Georgia Secretary of State's office has a Diablo Systems, Inc. terminal.

The pilot program will run through the Nov. 6 general elections. Afterward, the FEC will survey the participating state officials to determine whether public and media interest justifies expanding the program to other state election offices, officials said. Henry Edgerton, a disclosure specialist at the Chicago site, said the system has been so popular that his office has produced more than 200 printouts of FEC finance reports for reporters and political activists since it began in mid-June.

Hooper, at the FEC, said future test sites may include the states of Washington, Rhode Island and Alabama, but the commission has not yet approved any expansion.

Congress OKs high tech week

WASHINGTON, D.C. — The U.S. Congress recently enacted legislation that establishes Sept. 30 through Oct. 6, 1984 as "National High-Tech Week." The commemorative legislation was sponsored by Sen. Paul E. Tsongas (D-Mass.) and Rep. Mervyn M. Dymally (D-Calif.).

Sponsors said a week of activities is planned to increase public awareness of the contributions of technology to American living and particularly to educate the nation's youth about such industries as biotechnology, robotics, telecommunications, computers and microelectronics.

The Senate passed the resolution Aug. 10, following House passage on June 19. Meanwhile, the Senate on Aug. 10 approved a resolution, sponsored by Sen. Pete Wilson (R-Calif.), to designate October 1984 as "Computer Learning Month."

Meet to cover graphics

SAN FRANCISCO — A seminar on "Computer Graphics for Business" will be offered by the Technology Transfer Institute here Nov. 26-28 at the Hyatt Hotel on Union Square.

The seminar's leader will be Alan Paller, chairman of training for the National Computer Graphics Association and president of Applied Urbanetics, Inc. The seminar reportedly will be tailored to the needs of executives, managers and information systems professionals and will offer guidelines to selecting graphics hardware and software.

Registration for the seminar costs $795 from the Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

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Bogus DP certificate surfaces at DPMA

CHICAGO — The Institute for Certification of Computer Professionals (ICCP) is alerting employers in the computer and information processing fields of the first bogus Certificate in Data Processing (CDP) to be presented as a professional credential.

George R. Eggert, executive director of ICCP, said that an applicant for a computer science faculty position presented the certificate to the head of an Eastern university's computer science department. The phony certificate had an incorrect date and the wrong president's name on it.

The potential employer, certified himself, recognized the faulty data and contacted the Data Processing Management Association (DPMA), the agency that issued certificates until ICCP took over in 1972, for verification.

Lawyers for DPMA and ICCP have decided to issue strong "cease and desist" letters to the offender.

This is the only such incident that has been reported to Eggert, but the ICCP director said he is interested in knowing about them.

Eggert said he receives four or five calls a week from employers who inquire about whether a potential employee is, indeed, certified. In such an inquiry, Eggert's organization will give a yes or no answer and will tell whether the person passed the rigid certification project, but will not reveal grades.

The institute's CDP and Certificate in Computer Programming (CCP) programs are accrediting a steadily increasing number of professionals. In 1980, 3,700 people passed through the program, and in 1984, Eggert expects that number to be around 8,000.

In addition to experiential and educational requirements, ICCP insists on adherence to a code of ethics for computer professionals who are in the areas of business, science or systems analysis.

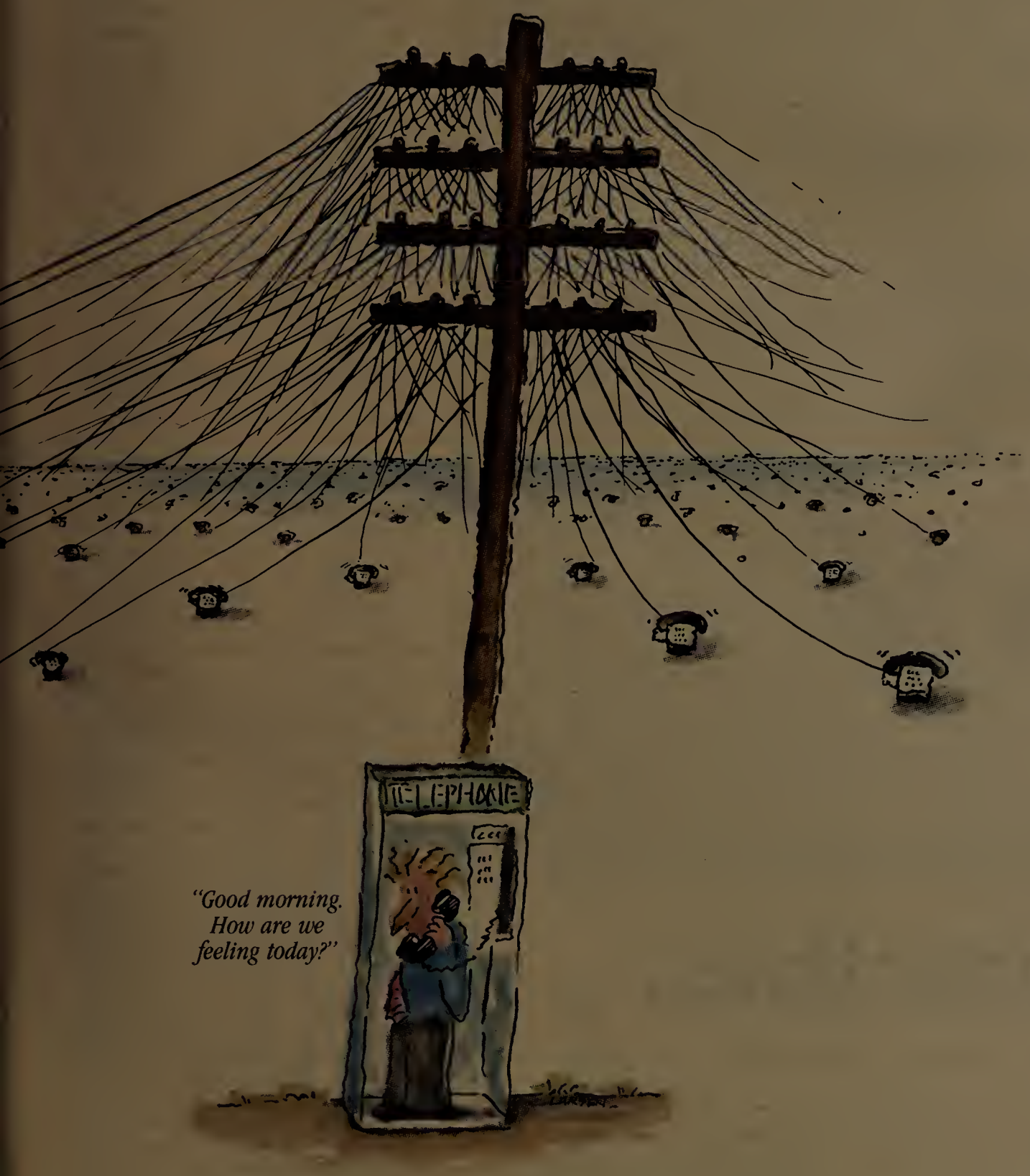
More information on certification or checking can be obtained from the ICCP, 35 E. Wacker Drive, Chicago, Ill. 60601.

AI book becomes fourth volume in Afips series

RESTON, Va. — The American Federation of Information Processing Societies, Inc. (Afips) has introduced *Artificial Intelligence*, the fourth volume in its Information Technology series.

The book contains papers from the first phase of AI development and also covers knowledge engineering, problem solving, AI programming languages, applications and image understanding.

The volume costs $23 prepaid or $23 plus $3.50 postage and handling for orders not prepaid. More information is available from Afips, 1899 Preston White Drive, Reston, Va. 22091.



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NEWS

Consultant urges employers to check certification claims

Robert Half, head of the nationwide employment agency of the same name, said that his agency does not run into many people posing with false certification, but they are out there and they will do anything to get the job they want. Half's agencies do not usually check references because, "If you do something, you are assuming a responsibility that really belongs to the employer," he said.

Half, who has been in the personnel consulting field for 35 years, recommended that employers call the certifier routinely, "Whether or not a person is certified is public information."

Whether certification is worth anything in the data processing marketplace is open to question. Wayne Emigh is vice-president and general manager of Source EDP Personnel Services, Inc., another nationwide recruiting firm that deals exclusively with computer professionals. According to Emigh, "Certification in the computer industry today holds little or no significance, in proportion to the importance of academic or experience credentials."

Emigh said that if certification catches on, then his agency will pay some attention to it. While any kind of certification is a plus for a job candidate, Source EDP rarely sees occasions where firms ask for it, he said.

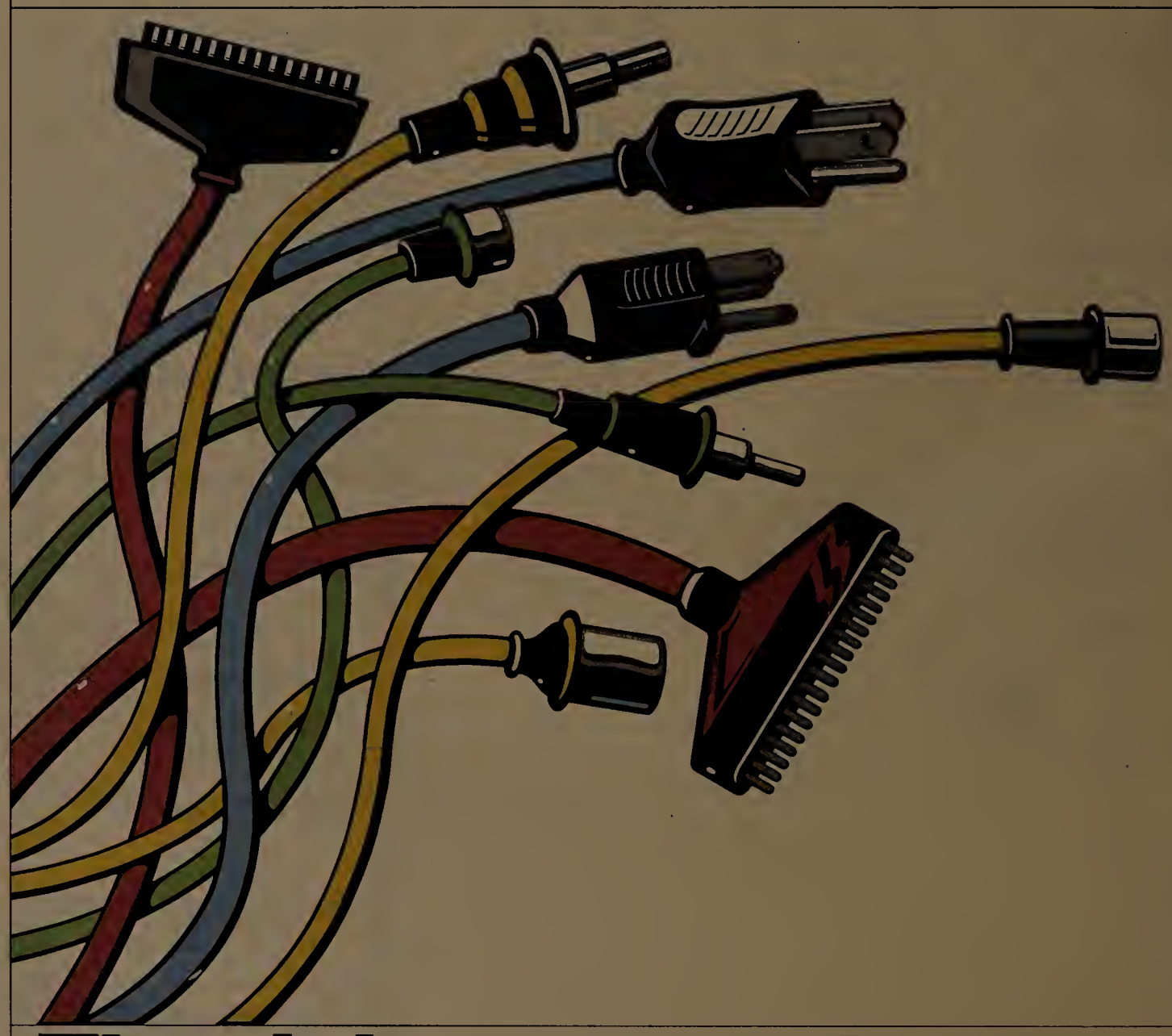
Half cautioned that no one can check references completely. While certification is a plus in hiring, he said, "without examination it doesn't mean much." He has found that employers do not usually look for certification, but they respect it when they find it. Half added, however, that if he was in the computer field, he would want every credential he could get.

Half recommended that employers check with the highest level person they can find who knows the prospective employee, and that employers expect the least valuable information from personnel departments. He also suggested that when presented with a list of references, call those people, and also ask them for names of other people who know the candidate. Half cited data in a study by Burke Marketing Research in Cincinnati which showed that while companies expect a candid reference, people who are called claim to be less than candid.

In giving references, according to the study, 25% of people are candid in writing, 46% are candid on the phone and 56% are candid in person. If the person you are asking for a reference is a friend of yours, you can expect him to be candid about half the time, the study predicted.

Questionable references do not always mean that the candidate is unsuitable, according to Half. Try to find out information like absentee and tardiness rates, and be specific with questions. For instance, if a reference says that John Doe does not pay attention to detail, get specific instances of his lack of concern for detail. Sometimes, the problem is not the candidate's, but the referencer's, Half said, or the questionable attribute might not be important in the new job. Ultimately, he said, whether to hire or not to hire is based on an employer's intuition or feeling for a prospective employee.

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PC World Expo to offer micro software clinic

DALLAS — A free software clinic for microcomputer users will be one of the features of the PC World Exposition exhibit and conference series to be held at the Dallas Market Hall here Oct. 3-5.

Sponsored by *PC World* magazine, the exposition will offer a seminar series featuring presentations by experts in the fields of high technology and office use of computers. Among the scheduled speakers will be Esther Dyson, president of Edventure Holdings, Inc.; Richard Rabins, president of Alpha Software Corp.; Dr. Robert Harp, president of Corona Data Systems, Inc.; and Andrew Fluegelman, editor in chief of *PC World*.

The conference will offer special program tracks for corporate executives and DP professionals, small business professionals, retailers, distributors and manufacturers of micros and prospective micro users. Other sessions will cover word processing and office automation, data base management, software writing, business and design graphics, spreadsheet preparation and micro networking with public data bases and mainframes.

The free software clinic will give users an opportunity to meet with software experts to discuss issues of compatibility, service and efficiency in business applications. The exposition will also feature exhibitors of IBM Personal Computer and compatible accessories and software. General admission to the PC World Exposition is $15 and admission to the entire three-day conference and exhibits is $35.

Additional information is available from Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

NEWS

Technology aids in re-creation of ancient Mexican city

WALTHAM, Mass.— On the hilly campus of Brandeis University here, Prof. George Cowgill is living in the past.

As with most anthropologists, the past is an integral part of Cowgill's work. So, too, is today's technology, which has helped Cowgill and other researchers re-create the image of a world that existed from 100 B.C. until the eighth century A.D.

Since 1964, Cowgill has been working with Rene Millon of the University of Rochester (N.Y.) and 15 other senior academicians in mapping out the lost city of Teotihuacan, Mexico, 25 miles northeast of Mexico City.

A popular stopping-off place for tourists, Teotihuacan is most noted for its ruins and scores of pyramids, some as large as the Great Pyramids of Egypt.

Using information from more than one million fragments of stone and pottery collected throughout an 8-sq-mile area, Cowgill and his colleagues have mapped out their interpretation of the ancient city.

The result of their work is a two-volume collection of contour maps that depict archeological and topographical information of the area. Next to each map is a plastic overlay with archeological interpretations of the site based on the data gathered and read into Brandeis' Digital Equipment Corp. Decsystem-10 mainframe.

From their data, Cowgill and Millon discovered that residents of the city lived in large clustered housing units or apartment compounds housing between 60 and 100 people, all from different social classes. The two have found that the city was much bigger than originally believed and have discovered remnants of hundreds of workshops that specialized in chipping obsidian rock.

Over the years, Cowgill has used computers to build and store his data base that identifies sites and the material found on those sites. In one segment of the research, a California Computer Products, Inc. plotter was used to generate contour maps of areas containing similar proportions of specific pottery types.


Cowgill

Getting to that point was no easy task, Cowgill recalled. "The time spent building the files was almost endless." Back in 1971, detailed information about the type and location of stone fragments found was put onto punch cards, and transporting that material was difficult. "I can remember driving around in a Volkswagen Beetle with 27 boxes of punch cards on the back seat," he said. Today, graduate students and workers at the field laboratory in Teotihuacan use an Apple Computer, Inc. Apple IIe to record information about the current reexamination of the pottery pieces found at Teotihuacan, including 45,000 figurine fragments found at the site.

Information on those fragments, Cowgill said, is being put on the Apple using Applied Software Technology Co.'s Versa Form data base management system. To make things easier, he added, he plans to have the floppy disk mailed to him at Brandeis, and he will transfer that information onto the DEC system.

Cowgill works at home on his Apple IIe and said he hopes that as technology progresses, he and his partners will be able to generate more information about the lost city.

He added that he also hopes to use computers to publish additional maps containing more detailed information on reduced scales or even generate the maps entirely by computer.

Leasing focus of N.Y. meet

NEW YORK — A seminar on third-party leasing will be offered here by International Computer Negotiations, Inc. (ICN) Sept. 24-26. The seminar will also be held Oct. 22-24 in Los Angeles.

Conducting the seminar will be ICN President Joe Auer, along with attorneys Richard M. Contino, Robert R. Ross and Frank Aiello.

Auer is founder and chairman of the advisory board of the "Computer Negotiations Report" and the author of the "Third-Party Leasing Handbook." He founded ICN and is a partner of both Computer Negotiations Australia and ICN-Europe.

Contino is the author of *Legal and Financial Aspects of Equipment Leasing Transactions*. Aiello has authored two information systems contracting manuals. The two are partners with Ross in the firm of Contino Ross Benedict.

Registration for either seminar is $895. Additional information is available from ICN, Suite 1707, 200 St. Andrews Blvd., Winter Park, Fla. 32792.





Ft. Benjamin Harrison

Handprints tested as ID on Army ATMs

By Maura McEnaney
CW Staff

INDIANAPOLIS — About 3,000 U.S. Army trainees at Ft. Benjamin Harrison here are getting some "hands-on" experience when it comes to their financial affairs.

The U.S. government recently began a five-month test that will use biometrical handprints in place of personal identification numbers (PIN) in automated teller machines (ATM) that will dispense pay to Army trainees.

The government wants to get away from the traditional and expensive method of dispensing checks, so it has installed two machines here similar to the ATMs now used at financial institutions throughout the country.

The method is designed for the short-term trainees who do not have bank accounts and who often spend substantial amounts of time converting their cash to more secure forms of money, such as traveler's checks, said Joy Davis, spokeswoman for the Office of Government Financial Operations.

Using NCR Corp.'s 5070 ATM system and Stellar System, Inc.'s Identimat, the system lets an employee access money from his monthly paycheck by inserting a plastic access card into the ATM. Instead of entering a PIN, the employee will be instructed to turn around and put a hand on a metal plate, from which the length, width and geometric webbing of the fingers will be read, explained Dale Duda, Stellar national sales manager. Once the system recognizes the hand configuration, it will allow the employee to proceed with the cash withdrawal.

Hand identification prints have been used for about seven years as security devices to gain entrance into highly secure areas, Duda said. The machine has also been used as an identification method for meal plan students at the University of Georgia, he said.

The machine operates with a high-intensity light, with photoelectric cells that move internally in the machine below the hand. Five different scans of a hand are taken, and the average handprint is coded onto a magnetic card.

Each time a trainee accesses the machine, it compares the print with the information on the card. And each time the machine is used, the card will update the handprint information. For example, if someone is getting arthritis, the magnetic code will be updated with gradual hand changes each time.

According to Roger Jensen, NCR product manager, the NCR machine uses an RS-232 interface to communicate between the hand scanner and the ATM. Cost of the machine ranges from $17,000 to $20,000, Jensen said. Added to the Stellar system, the total cost of the machine could be in the $25,000 to $30,000 range, he said.

According to Jensen, "since the program has been in operation, the only thing that we've heard is that it is running without failure; but then again, a machine that new shouldn't be failing."

Despite the Army's testing of this pilot program, others in the ATM industry say they do not think the public needs or wants biometrical identification in ATM machines.

At Diebold, Inc., spokesman Michael Paulus said the magnetic stripe and PIN are still the preferred methods of access among consumers, and that for now, the company intends to keep using that method for its ATMs. "Because it's existing, because it's out there, because it works well, we've chosen to go that route," he said.

ICCP exam set twice yearly

CHICAGO — The Institute for Certification of Computer Professionals (ICCP) has increased the frequency of examinations for its Certificate in Data Processing (CDP) and Certificate in Computer Programming (CCP) to twice a year. Examinations will now be given on the first Saturday in May and the second Saturday in December.

The two examinations will be administered simultaneously for the first time at the same test sites throughout the world starting Dec. 8.

Examination announcements and instruction manuals are available from the ICCP, 35 E. Wacker Drive, Chicago, Ill. 60601.

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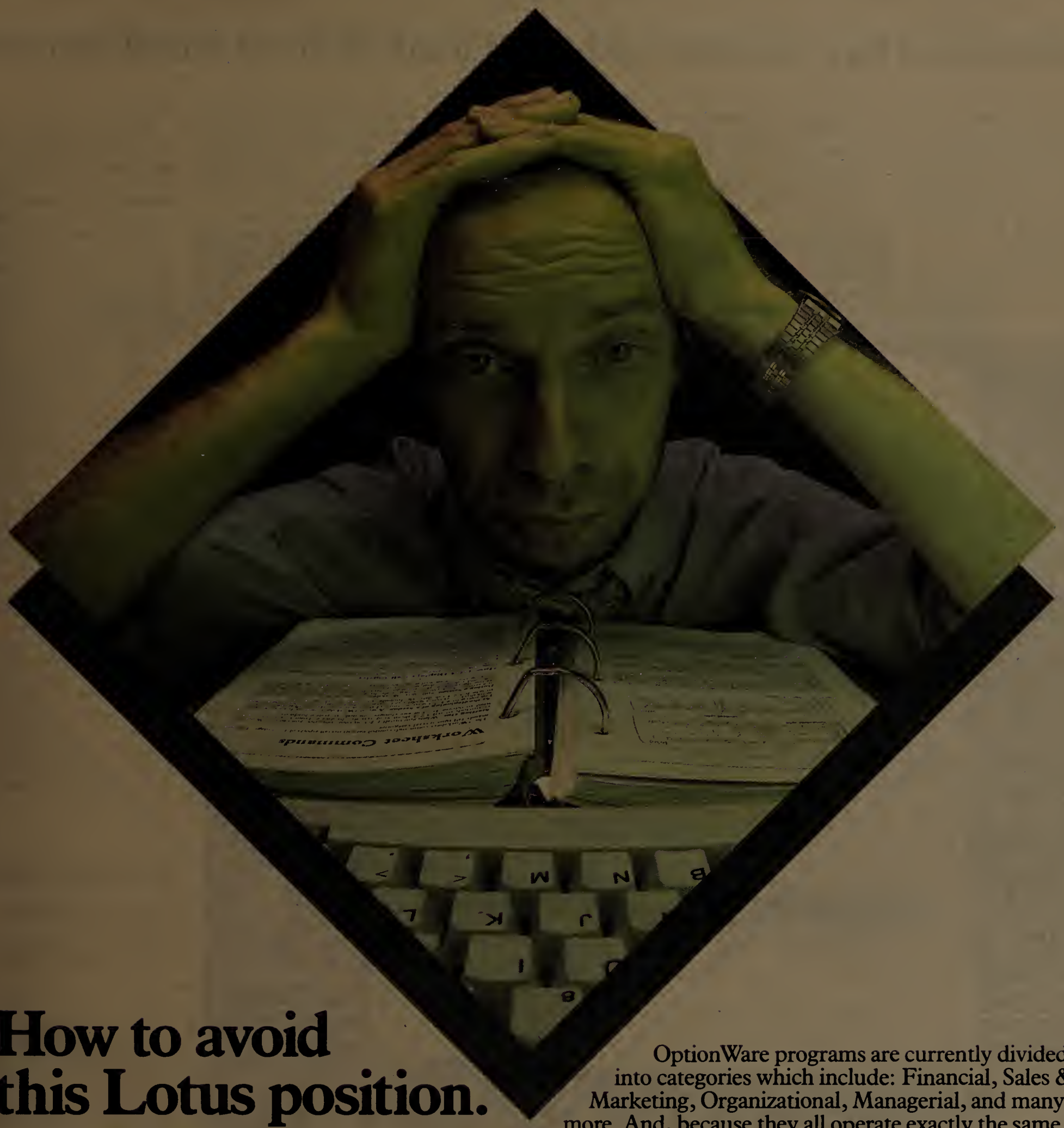
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NEWS

Californians buy gasoline with ATM bank cards at Mobil stations

SAN FRANCISCO — Two San Francisco banks and Mobil Oil Corp. have joined in a point-of-sale (POS) project through which bank customers can use their automated teller machine (ATM) cards to buy gasoline.

Mobil POS project manager John Rowerdink reported that more than 300 San Francisco-area and Sacramento, Calif.-area gas stations have been linked to the banks through an existing Mobil network that ties 2,500 stations nationwide to Mobil's Kansas City, Mo., data center.

Crocker Bank and First Interstate Bank ATM cardholders will be able to use those cards at 750 Mobil stations in California when the project is completed later this month, according to Rowerdink.

He reported that the debit card option is an addition to Mobil's existing POS system, installed at the 750 California Mobil stations, and is being installed in Washington, Oregon, Florida, the District of Columbia, Pennsylvania and New Jersey. He said the debit card system was field-tested at 60 Washington, D.C., stations. At present, the POS stations in the remaining states accept charge cards, not debit cards.

Bank officials reported that the system involves using dedicated data lines to link the banks to Mobil's Kansas City facility for payment authorization and reporting.

With the system, motorists give their ATM cards to gas station attendants or cashiers, who run the cards through a cardreader and key in details of the gasoline sale. The motorists, using either a keypad attached to a Datatrol, Inc. FT 3205 terminal or a portable keypad that the attendant brings to the car, then punch in their personal identification numbers.

The transaction details are transmitted from the POS terminals to Mobil's Tandem Computers, Inc. Nonstop II and TXP processors in Kansas City and relayed to the bank computers for verification of the identification numbers. Approval or authorization is then relayed back to the terminal via Kansas City and the transaction logged, with the sale amount deducted from the customer's bank account.

According to Loretta Masters, Crocker Bank's associate product manager for POS services, all of the communications should take between five and 10 seconds.

She noted that the Mobil project is independent of Crocker's involvement in Interlink, a POS project being developed by five major California banks.

Cullinet users to convene in Las Vegas

LAS VEGAS — Cullinet Software, Inc. has announced that its annual North American User Week is scheduled from Sept. 30 to Oct. 4. It will be held at the Las Vegas Hilton and at Caesars Palace in Las Vegas.

This year's conference is scheduled to focus on Goldengate, Cullinet's integrated personal computer software package, and there are plans to discuss other Cullinet packages, such as IDMS/R, a relational data base management system, and Human Resource System and Information Database.

Expected events include formal courses, enhancement sessions, special interest discussions, user presentations, informal workshops and online demonstrations.

More than 2,000 professionals, including managers, senior managers, consultants and system users, are expected to attend the users conference.

The registration fee for the seminar is $750.

Cullinet Software is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

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System problems leave shelves bare at N.H. liquor stores

By Donna Raimondi
CW Staff

CONCORD, N.H. — Managers of the liquor stores in this state faced empty shelves in the middle of the busiest vacation season of the year. The computers designed to make the liquor operation here run smoothly have not helped the situation.

Liquor is the state of New Hampshire's third-highest source of income, accounting for about $50 million in revenues annually.

Several managers of the more than 70 state-run liquor stores scattered around New Hampshire discovered recently that they were short of alcohol, a serious problem during the busy vacation season of this lake- and mountain-studded summer haven.

Computers at fault

According to David J. Griffiths, director of data processing and accounting for the New Hampshire State Liquor Commission in Concord, the problems stem from the computers used to track distribution for those stores.

About 18 months ago, a Sperry Corp. 1100/60/C2 mainframe was brought in to handle distribution, inventory tracking, accounting and all other applications that deal with the business.

In June 1984, a conversion from an old system to the new one produced minor glitches, such as bottle quantities being mistakenly converted to case quantities.

Big problem

The big problem ensued when Sperry's Mapper data base management system was installed and it took much more processing time than was originally anticipated, Griffiths said. There is not enough space or time left on the computer in which to perform all the related tasks necessary to run the liquor commission's business.

Griffiths has had to add a third shift in the DP department, which now runs 24 hours a day, 6½ days a week, to deal with the backlog.

To complicate matters, preparations for the Christmas rush begin in early September. November and December bring a huge increase in business, and the ordering and related administrative tasks require gearing up all through the autumn season. "We're at the limit now, and business is increasing all the time," Griffiths said.

Each liquor store is automatically polled during the night, every night, for sales information such as dollar figures, administrative details and movement of merchandise.

During working hours, such data is entered into the three Data Terminal Systems, Inc. DTS 520 smart cash registers that each store has.

Four Digilog, Inc. Digilog 1500 microprocessors in the DP department in Concord, attached to four telephone lines, dial automatically after the stores close to extract the information.

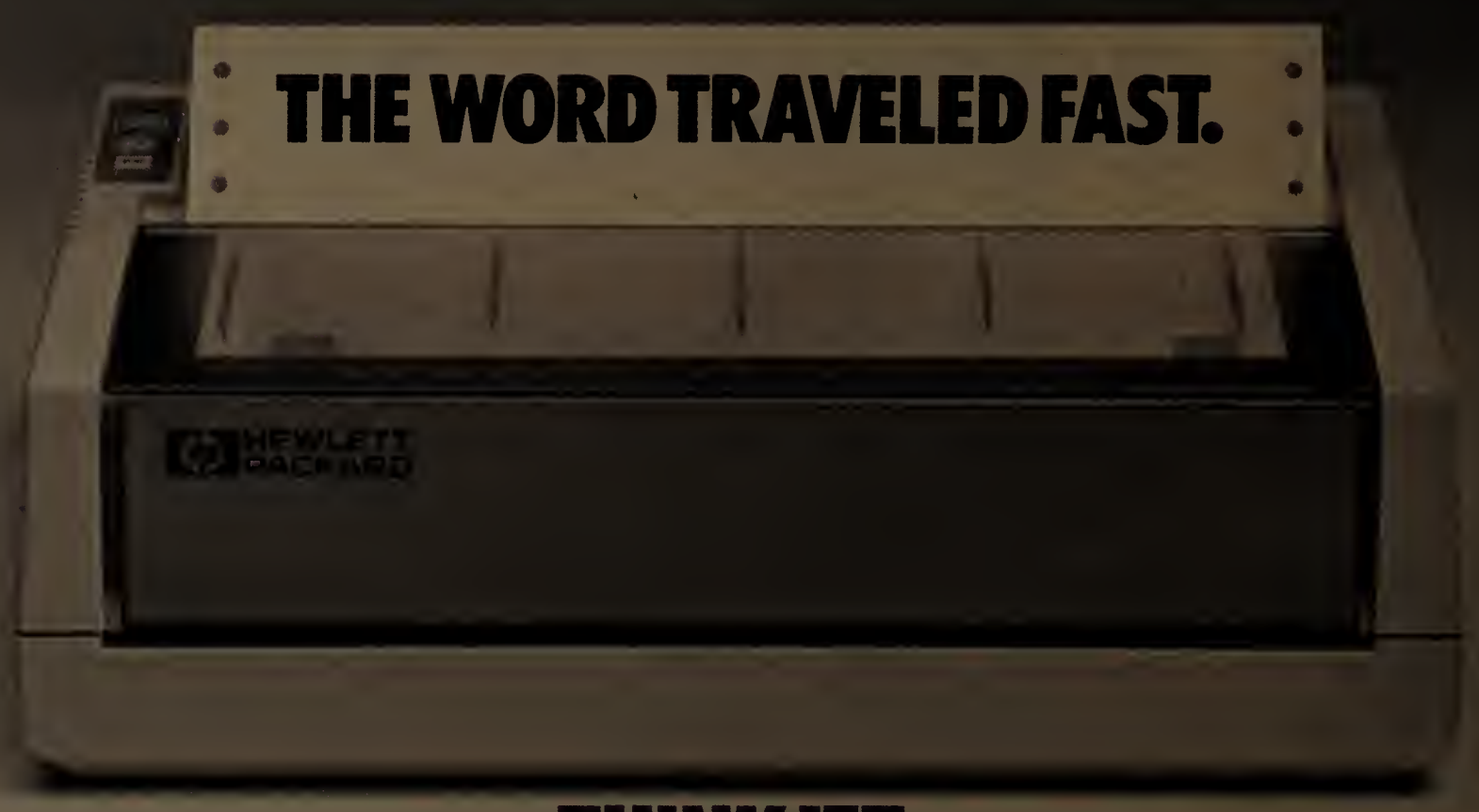
In the morning, the data is passed into the mainframe for processing. One of the uses of this information is to order items as they become low in inventory.

Due to the production backlog, information was not being passed from the stores to warehouses. The warehouses were backed up two weeks, and the stores were understocked, Griffiths said. A massive delivery effort when the problem was discovered left the warehouses understocked.

Sperry is in the process of upgrading the hardware to alleviate the problem. It will increase the capacity of the main processor from C2- to E2-type processors, increase the number of disk drives and double the capacity of I/O channels between disk drives and the main processor so data can move twice as fast. Griffiths is confident that Sperry will finish the job by late September or early October.

In the meantime, the Liquor Commission's latter-day DP elves will be burning the midnight oil in preparation for Christmas.

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NEWS

Visa program identifies frequent targets of credit card fraud

By Maura McEnaney
CW Staff

SAN FRANCISCO — In a continuing effort to combat credit card fraud, Visa International recently implemented a "Risk Identification Service" designed to identify merchants who have an unusually high proportion of unauthorized Visa transactions.

According to company spokesman Dan Brigham, the new program, implemented in July, tells member banks which merchants are making transactions on lost, stolen or counterfeit credit cards.

The program uses an off-line process on two IBM 3083s, one on the East Coast and one on the West Coast. The system takes Visa's Base I data base of fraudulent accounts and compares it with its Base II program listing sales transactions in any one day, Brigham said. If a card was used the day before or anytime after it showed up on the fraudulent-account data base, it is considered to be a suspicious transaction, he added.

The file is then separated according to merchant. If a merchant appears to have an abnormally high number of suspicious transactions, a report is sent to the member bank that issued the account, Brigham said. It is then up to the individual bank to investigate and possibly reevaluate its relationship with that merchant.

According to Visa systems development manager Brian Ruder, a statistical process predetermines what percent of fraudulent transactions would be considered abnormal for each merchant category. (A stereo store, for instance, may be a more likely target of fraudulent credit card users than a greeting card store.)

When the data is put into the computer, merchants in the top 1% of their category are flagged and included in the report.

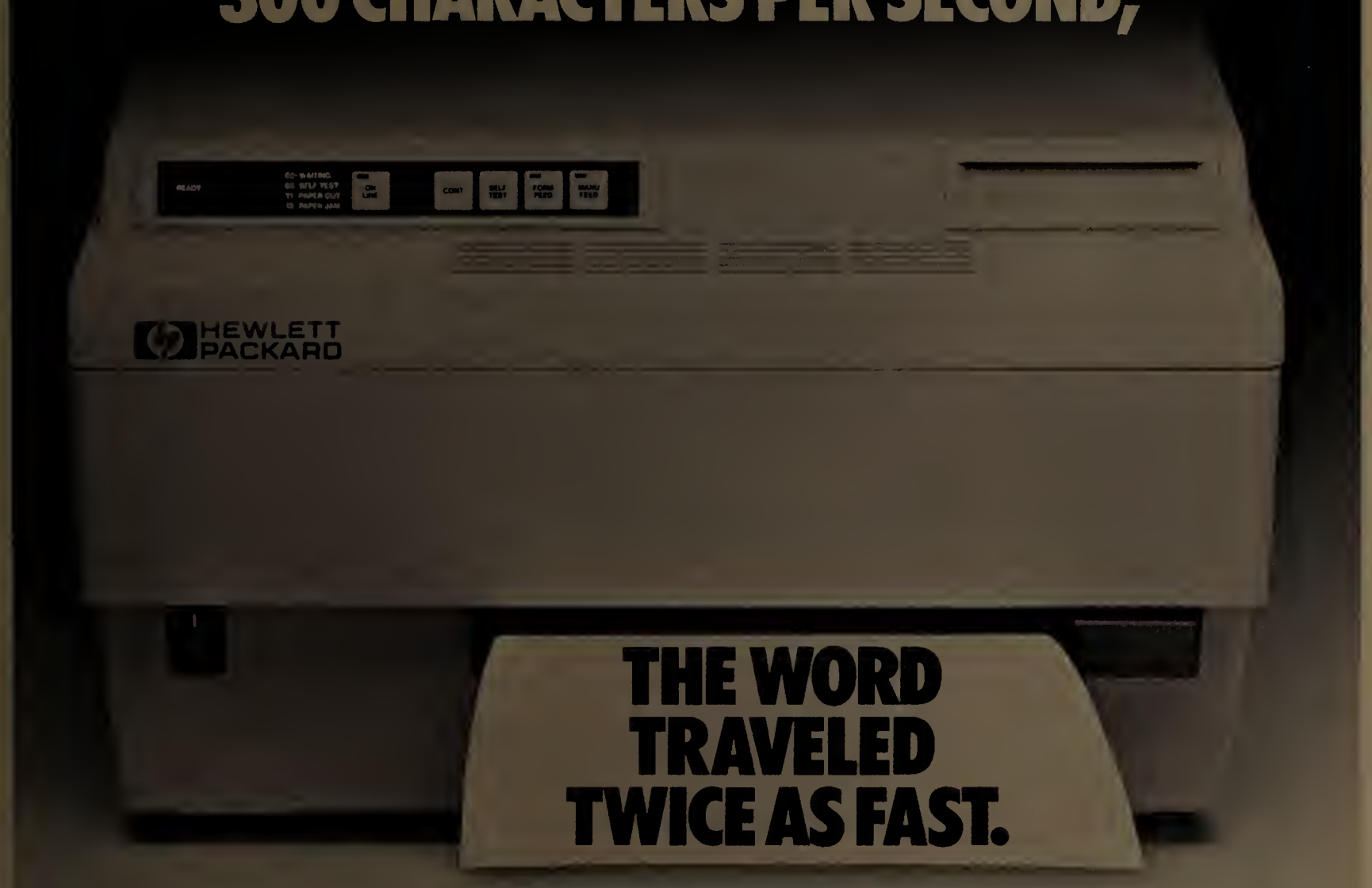
During a program test last year, 75% of the transactions identified by the computer as suspicious were fraudulent, Ruder said. Among the merchants cited were a shoe store in Milan, Italy, that was charging $630 for a single pair of shoes; a Southern California stereo store owner continually plagued by criminals who had discovered he did not use Visa's authorization process; and store owners who would "launder" Visa sales drafts, buying them from illegitimate Visa merchants.

Visa's first worldwide report, issued last month, identified 407 merchants with suspect transactions enrolled by 107 banks, Brigham said.

There are more than 4 million merchants, 150,000 banks and 106 million credit cards now in the Visa system. And although credit card fraud last year accounted for $112 million (less than .2%) of its $70 billion in sales, Brigham said the company still hopes the program will significantly cut down on credit fraud.

Systems of these sorts are not exactly new, however. Mastercard International, Inc. has been identifying merchants with a high fraud record for about a year, according to Thomas Kelleher, Mastercard's vice-president of security and fraud control.

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NEWS

Neic system speeds processing of health insurance claims

By Donna Raimondi
CW Staff

In an effort to contain the escalating costs of health care, 11 large insurance companies joined forces in 1981 to form the National Electronic Information Corp. (Neic). Neic is a clearinghouse designed to speed the processing of hospital claims [CW June 15, 1981], thereby attacking the administrative costs of health care.

Neic has developed a data processing system and network capability, called the Health Claims Distribution System (HCDS), to enable health care providers to submit claims information electronically to insurers using HCDS.

The Neic system was based on federal standards for use in the Medicare program. Boeing Computer Services Co. was hired to develop and operate the data processing system from their IBM installation in Vienna, Va.

At the time of its inception, Neic projected that by January 1984 the HCDS would be nationally implemented. In 1983, only 150,000 claims were processed through Neic. Since the beginning of 1984, the rate of increase in claims processing has been, on average, 38% per month, according to William King, vice-president of systems at Neic.

Most of the problems in implementing the HCDS have been tied to the design and distribution of identification cards, King said. Insurance companies and Neic met and worked out designs that were acceptable to each, and the insurance companies have now distributed cards to 20 million insured employees.

Neic has gradually taken over development of the system programs from Boeing, which will continue to provide the networking system on their IBM 3081s, according to King.

Most Neic users have either IBM systems or IBM emulators. For those that do not, Neic developed programs to deal with the incompatible operating systems.

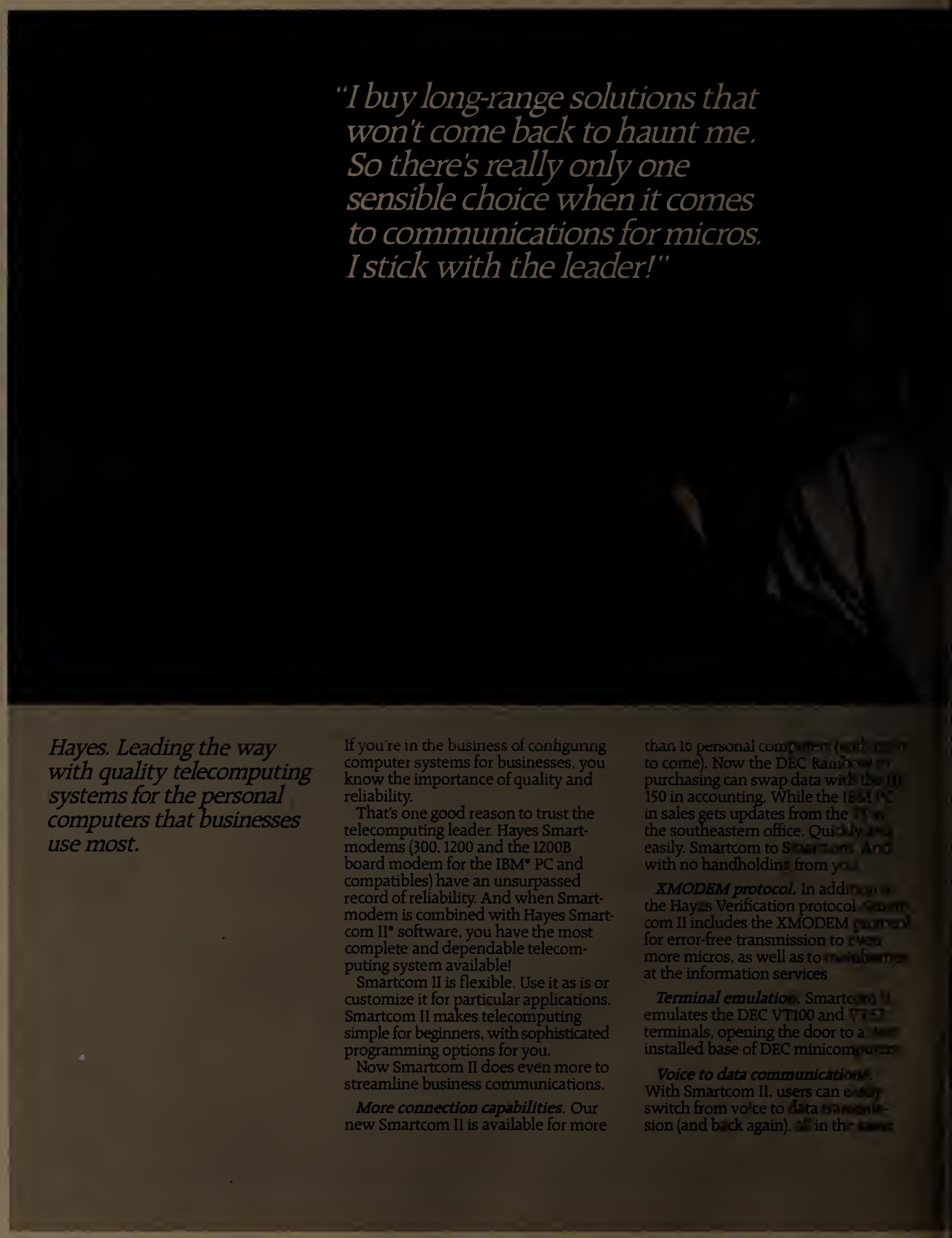
Health care facilities often did not use the system because they had not yet adopted Uniform Bill 82 (UB82), the federal guidelines for reporting claims on which Neic based its system, according to King. He indicated that by the end of 1984, all hospitals will have complied with the standards, since the federal government has set an Oct. 1 compliance deadline.

After a contract is signed, Neic's support services staff surveys the facility involved to find out what its capabilities are, trains existing programming and communications people and, if the facility has no technical people, determines what equipment and training will be necessary for successful implementation of the system. The test phase for a newly set-up system can take from two weeks to two months.

Patient claims records are destroyed after 30 days, and elaborate protective systems are kept in place to protect patient confidentiality, according to King. The only kind of data that Neic tracks is a count to ensure that there are as many claims coming out as the number that went in for processing, he said.

Some of the purported benefits of this system to carriers and hospitals are time savings, claims standardization and staff reduction, King said. The time frame for processing claims used to be from 45 to 60 days, and that has been cut to 10 to 14 days, he added. Neic's part of the processing consists of receiving the claim, editing it for completeness and accuracy and sending it on to the proper carrier.

By adhering to UB82 standards, Neic has encouraged the insurance industry to standardize claim formats, King said. Overhead costs are reduced, as the largest number of claims need no further investigation, and mailroom and clerical costs are cut because the information is transmitted electronically, he added.



NEWS

Insurance companies adjust to Neic claims processing network

BOSTON — "It had its rocky moments, obviously. Any new product does, but it is working well now," said John Baker, senior consultant at the John Hancock Mutual Life Insurance Co. here. That statement sums up the experience of several users of the National Electronic Information Corp.'s (Neic) claims processing network.

John Hancock staff is making software and hardware changes to its data processing system so that claims will flow directly from Neic's computers into John Hancock's computers for immediate processing, Baker said.

The distribution of identification cards, which must be presented by the patient to the hospital in order for the Neic system to work, caused some problems for early subscribers to the system.

Original user

John Hancock, one of the original users, had a commitment to Neic to deliver a certain number of cards to its clients by a specified date, which it accomplished. But as Baker put it, "Sometimes client priority is not the same as John Hancock's."

The Neic way of processing claims saves John Hancock from 30% to 40% on medical claims costs for services such as tonsillectomies, which are routine and need not be investigated by the insurance company, Baker said. For less common types of medical care, such as open-heart surgery, the savings are modest because the insurer must still investigate the claim, he said.

At St. Joseph's Hospital in Houston, which participated in a pilot program using Neic, only employees of large oil companies and area banks were presenting the cards at first. Dennis Solberg, billing manager at St. Joseph's, credited Aetna Life & Casualty Co.'s push to enroll its clients in the network as soon as possible with the present use of the system by smaller businesses.

Aetna is in the process of developing in-house a system for handling, storing and processing claims with no manual intervention — a project that should finish development in about three years, according to Gilbert Valdez, Aetna's director of electronic billing systems.

Half of Neic's business

Aetna's commitment to the electronic claims system was pivotal, as it accounts for about half of all Neic business to date, according to Valdez.

Aetna has distributed 10 million cards so far, and approximately 75,000 cards a week are being mailed out, according to Valdez. Aetna's goal is to reduce service costs to customers, which will, in turn, make Aetna more competitive in the marketplace.

Neic based its claims system on national standards set back in 1981, but hospitals have been slow to use them. Federal standards have increased the amount of information that must be supplied when filing claims. Solberg is convinced that Neic could make life easier for its billing personnel by reducing the screen formats.

Valdez said he was excited about Neic's commitment to process physician claims. Aetna handles 47 million claims each year, 80% of which are medical.

Charles T. Kenyon, vice-president of customer services in the group life and health division of the New England Mutual Life Insurance Co., echoed Valdez's sentiments.

His company, which recently joined Neic, processes eight or nine physician claims to every hospital claim. How fast New England Mutual will see dollar benefits from the physician claims program will depend on where their policyholders are located in relation to where the Neic-signed physicians are located, Kenyon said.

Valdez pointed out that 70% to 75% of insurance carriers' costs are staffing costs, which must be reduced to contain the ever-increasing expenditures for health care.



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NEWS

Paper firm relies on voice-based inventory system

By Kathleen Sullivan
CW West Coast Bureau

BUENA PARK, Calif. — Wanted: Paper distributing firm seeks capable worker to answer telephone inquiries from statewide sales force. Must be able to handle four calls simultaneously, providing accurate information on the company's inventory of fine paper, industrial packaging, copy products and computer supplies. Apply to Noland Paper Co., an equal opportunity employer.

In this case, the best worker for the job was a computer — or rather, a computer that could talk. Noland, located here, recently installed its own voice-based inventory tracking (V-Bit) system, designed to give its sales team quick access to information on the 7,000 items in its master inventory file.

The firm expects the system to cut down calls to the switchboard by 15% and eliminate the need for order desk personnel to handle stock inventory calls by the sales staff.

At the heart of Noland's V-Bit system is an IBM Personal Computer, equipped with a voice synthesizer and a telephone interface, that in turn is linked to the firm's ICL, Inc. System 10 mainframe. The IBM Personal Computer contains two interactive telephone interface cards designed by Vynet Corp., a Campbell, Calif.-based company. Each card can handle two incoming calls.

When a salesman calls in, the call is answered by the Personal Computer, which identifies itself by issuing a series of chimes. After entering an access code number into a Touch-Tone telephone and receiving the authorization to proceed, the salesman hears a deep voice say, "Enter an item number."

Using the phone's keypad, the salesman enters an inventory item number. The V-Bit's software, designed by Radio Access, a Fort Lauderdale, Fla., software development firm, verifies the item number before it is sent to the mainframe. Once the mainframe receives the request for information, it searches its files and then gives the Personal Computer the number of items currently in stock and the number on order for the product requested.

Guy E. White & Co., a Calif.-based computer consulting firm, designed the System 10 inquiry program that communicates with the Personal Computer.

Since the system includes a syntax processor, the Personal Computer can read the number to the salesman, saying "one hundred," for instance, instead of simply listing the numbers as "one, zero, zero."

According to Donald Suwyn, data processing manager for Noland, the system has been a tremendous success so far. The firm expects the V-Bit system to cut down calls to the switchboard by 15% and eliminate the need for order desk personnel to handle stock inventory calls by the sales staff.

Before the V-Bit system was installed, a salesman's call would have been answered by the switchboard and then routed to the order desk. There, another Noland employee sitting at a terminal would search the mainframe's files for the item.

According to Suwyn, Noland's sales team includes about 100 people. The system has given the sales force around-the-clock access to the master inventory file. Before the V-Bit system was installed, he said, calls could only be accepted during regular business hours.

The system, which includes diagnostic software, has been operating without a hitch since it was installed in mid-August, Suwyn noted. The system can monitor four incoming calls simultaneously, showing the status of the calls on the Personal Computer's screen.

The company had considered a voice-to-voice system, which would have allowed the sales team to talk to the computer, instead of punching in numbers using a telephone keypad. But the company rejected that idea because it would have resulted in a slower, more expensive system, Suwyn said.

He said that the V-Bit system includes an IBM Personal Computer with two floppy disk drives, 256K bytes of memory and a Princeton Graphic Systems high-resolution color monitor.

Noland plans to expand the system, Suwyn added. The next step will be to allow the sales staff to contact someone on the order desk by punching an additional telephone key. Although the firm had considered automating the entire process, giving the sales force the ability to place orders by computer, he said the system would not have been able to generate a hard copy of the order at the customer's site. The firm is considering the use of portable computers with built-in printers to solve that problem, Suwyn said.



NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — Recommendations for a national objective, an information technology council and $110 million of federal money over five years were the three proposals of a report entitled "Information Technology in Australia." The $385,000 report, commissioned by Australia's Federal Department of Science and Technology, was released last week before an audience of computer industry representatives, academicians and senior public servants by Australian Minister Barry Jones. In unveiling the study's findings, Jones voiced just one regret — that the report had not been done 15 years earlier.

■

MELBOURNE — Australia's largest software and systems house, Computer Power Holdings, has opened a Singapore office and plans to open a Hong Kong office before the year's end. The software company, which is one-third owned by Rupert Murdoch's News Ltd., is best known for its banking software, developed by Hogan Systems, Inc.

CANADA

EDMONTON, Alta. — Kenneth Gordon, president of Myrias Research Corp. here, has announced that his company is on the verge of unveiling the Myrias 4000 supercomputer. According to Gordon, the machine will cost $12 million and will perform at the rate of 100 million instructions per second. Gordon is heralding the machine as the world's fastest.

CHINA

BEIJING — A VDT manufacturing facility opened here Aug. 4. The materials and technology for the factory were purchased from Compac Systems, Inc. of the U.S. by the Beijing Electronic Display Equipment Plant. The facility is expected to produce 20,000 units per year initially and eventually assemble microcomputers, high-resolution monitors and Chinese-character terminals and graphics systems, according to a spokesman.

■

BEIJING — The Ministry of the Electronics Industry here has signed a joint agreement with Altos Computer Systems, Inc. of the U.S. to produce multiuser microcomputer systems here. The systems will be based on existing Altos 16-bit technology and will be used in China for academic, industrial and commercial applications, sources said.

JAPAN

TOKYO — Sumitomo Electronic Industries, Ltd. unveiled two models of engineering workstations called the Ustation/E15 and Ustation/E5. The first model is said to perform twice as fast as the company's existing Ustation/E10. It is intended to handle graphics and image processing in environments where superminicomputer or large-scale systems have traditionally been required. Ustation/E5 is smaller and less expensive and aimed at the low end of the market. Both the Ustation/E15 and the Ustation/E5 systems are based on Motorola, Inc.'s 68000 microprocessor. Pricing on the two systems begins at $33,333 and $15,833, respectively.

TAIWAN

TAIPEI — National Advanced Systems, Inc. (NAS) has announced plans to distribute its line of IBM-compatible mainframe systems in Taiwan and Indonesia. The agreement will make NAS the only vendor offering a program-compatible alternative to IBM in Taiwan or Indonesia. The NAS distributors in each country will be RPT Intergroups International Ltd. and Metrodata, respectively.

WEST GERMANY

BONN — The West German Postal, Telephone and Telegraph Agency claimed that they now have 14,000 interactive videotex users here. Figures are expected to top 150,000 installations by year-end and 1 million installations by 1987, according to a spokesman.



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Firm's grueling DBMS quest leaves trail of humbled suppliers

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — One key participant called the procedure "the single most grueling process I've ever been associated with."

For four months, a developer of portfolio management software exhaustively grilled, probed, rated and analyzed more than 100 mainframe-class data base management systems (DBMS). The point of the exercise was to select the most suitable DBMS for a securities trading and accounting program that locally headquartered Koch Systems Corp. planned to develop for its customers in the financial community.

One by one, Koch subjected the DBMS vendors to an excruciatingly detailed battery of 75 questions aimed at assessing the capabilities of each would-be contractor's product. A typical interrogation lasted one to two days.

For many of the participants, the in-depth interviews and product evaluations quickly degenerated into an exercise in corporate humility. In response to pointed questions about their DBMS' capabilities, many of the vendors were forced to admit to serious technological limitations that quickly eliminated their products from the running.

"One guy we talked to, when we finished the questionnaire and added up his score, even said he was going to go to work for another company," according to George Koch, founder and president of Koch.

But although the process frequently proved tedious, it eventually yielded big dividends. In the end, Koch narrowed its original field of software candidates down to a single offering, a relational DBMS from Menlo Park, Calif.-based Oracle Corp.

The Oracle product was then used extensively in the development of Koch's securities trading and accounting system, which provides portfolio managers with up-to-the-minute information on the status of their clients' investments.

In evaluating competing DBMS products for its trading and accounting system, Koch looked closely at each candidate's data security capabilities. Because such systems are often involved in applications where millions of dollars change hands in a single transaction, security ranked as one of the company's key concerns.

So, too, did strict audit controls. "Some of the [DBMS] companies we talked to acted as if they had never even heard of audit trails," he said.

Although the Oracle system that eventually won the product evaluation was itself riddled with "termites" when Koch began using it, the software company liked its security features, which prevent transactions from being completely deleted.

Under Koch's Oracle-based system, the only way to undo a faulty transaction is to reverse it, in which case the program reportedly leaves a clear audit trail.

Exposition date fixed

NEW ORLEANS — The Eighth Annual Data Entry Conference and Equipment Exposition will be held here Sept. 24-26 at the Sheraton New Orleans Hotel.

Michael Anderson, president of Nixdorf Computer Corp., will discuss "Productivity Through Ergonomics" during his keynote speech Monday, Sept. 24.

Other topics at the conference, which is being sponsored by the Data Entry Management Association (Dema), will focus on office automation, technical writing and service bureaus of the future.

Registration is $425 for Dema members and $480 for nonmembers.

More information is available from Dema, P.O. Box 16711, Stamford, Ct. 06905.

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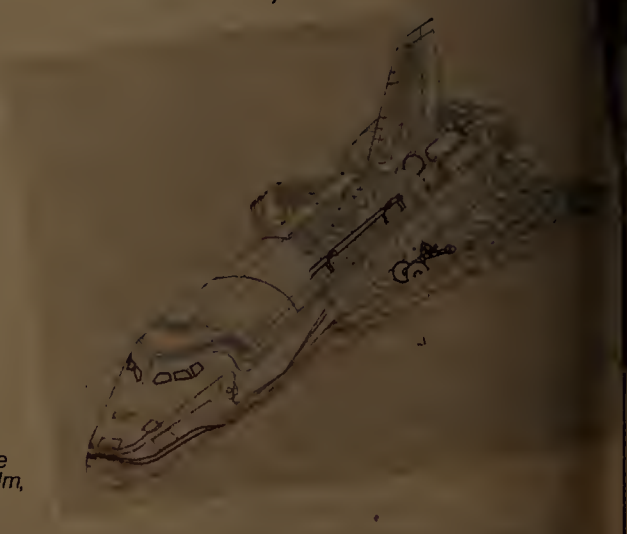
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NEWS

MANAGERS ON THE MOVE


Hawkins

NAOMI HAWKINS has been appointed to the new post of data processing manager at Natel Engineering Co., Inc. in Simi Valley, Calif. She has spent the last 2½ years working with ASK/HP3000 software, which is the core of a Hewlett-Packard Co. HP 3000 Series 40 computer system that was recently installed at Natel.

Hawkins came to Natel from Lightolier, Inc., where she was MIS manager. Prior to her work at Lightolier, she was a project manager and systems analyst with Allegretti Co.

Hawkins holds a B.S. in computer science from the University of Southern California and has pursued graduate studies at the same school.

■

RICHARD T LEFAVE has been named director of MIS operations for Nixdorf Computer Corp. in Burlington, Mass. In this position, LeFave is responsible for overseeing the development and management of the firm's internal MIS resources.

Prior to joining Nixdorf, LeFave was a consultant for Boeing Computer Services Co.

He holds a B.S. from Boston University, an MBA from the University of Puget Sound and an M.S. from the University of Southern California.

■

AARON A. WHITE AND THOMAS F. RUOTOLO have been promoted to senior vice-president and director, respectively, for Associates Bancorp, Inc. in South Bend, Ind.

White is responsible for the company's information processing services — specifically its computer operations in South Bend, Dallas and Chicago — and for product services, data security administration and support services.

He joined the company in 1960 as a tab operator. He was named director of information processing services in 1976 and was named vice-president of the same group in 1982.

White attended Indiana University.

Ruotolo is responsible for data resource management, micro systems development and advanced office systems, as well as direction of the company's development center and information center.

He joined the company in October 1982 as a manager of information resources management. Previously, he had held various data processing positions at the Hartford Insurance Group.

Ruotolo has a bachelor's degree in economics and an MBA in finance from the University of Hartford.

■

BRIAN ASPLAND has been appointed president and chief operating officer for Integral Systems, Inc. (ISI) in Walnut Creek, Calif.

Prior to his appointment, he served as president of the software division and senior vice-president and member of the board of directors at Information Science, Inc. Before his work at Information Science, Inc. Aspland served as vice-president at Interactive Data Corp.

Aspland is a graduate of Georgetown University.

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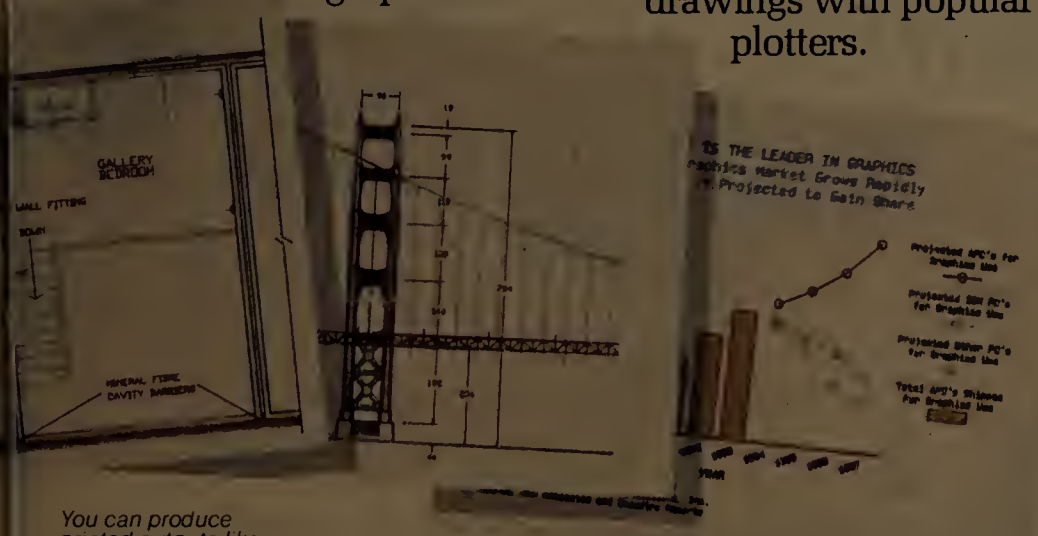
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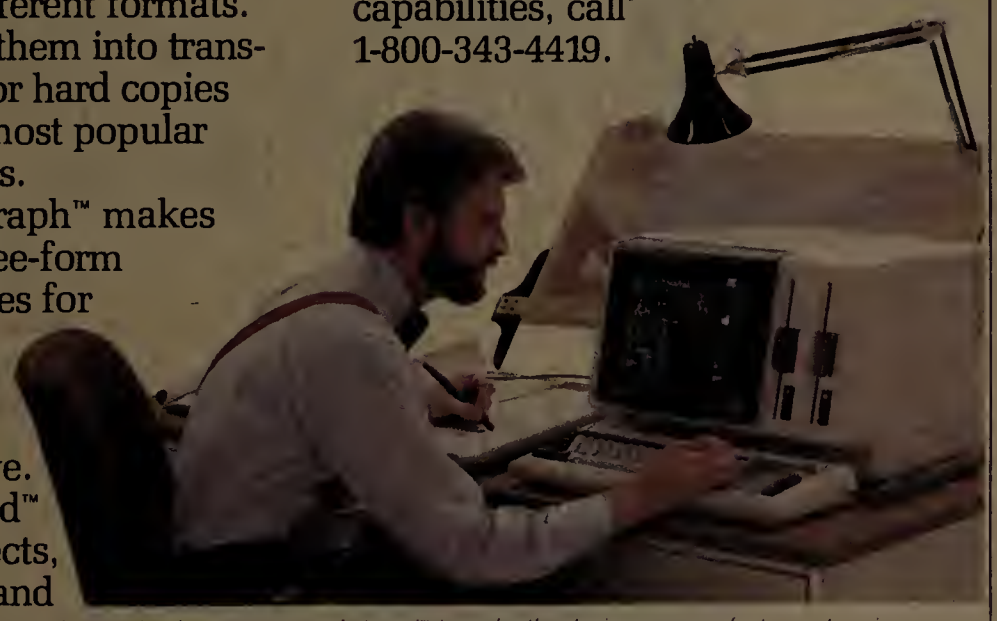


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Oxford users to convene

HASBROUCK HEIGHTS, N.J. — The Oxford Software International User Group will hold its annual meeting Oct. 22-24 at the Hyatt Regency Crystal City in Arlington, Va.

Commodore Grace Hopper, one of the authors of Cobol, will deliver the keynote address Oct. 22. The meeting will be divided into separate product sessions addressing Oxford Software Corp.'s products.

From now until Sept. 3, registration for the three-day seminar is $125 per person. After Sept. 3, registration will cost $150 per attendee.

Further information is available from the Oxford Software International User Group, 174 Boulevard, Hasbrouck Heights, N.J. 07604.

CALENDAR

WEEK OF SEPT. 23

SEPTEMBER 24-25, LOS ANGELES — **World Conference on Ergonomics in Computer Systems.** Contact: Robert W. Bailey, Computer Psychology, Inc., P.O. Box 16, 54 E. Main St., Mendham, N.J. 07954. Also being held Sept. 25-26 in Dallas, Sept. 26-27 in Chicago, Sept. 27-28 in New York and October 1-2 in London.

SEPTEMBER 24-27, HONG KONG — **The Fifth South East Asia Regional Computer Conference and Exhibition 1984.** Contact: Kristie Siverts, Cahners Exposition Group, P.O. Box 7007, 7315 Wisconsin Ave., Washington, D.C. 20088.

SEPTEMBER 24-27, HOUSTON — **Managing with Micros.** Contact: The U.S. Professional Development Institute, Managing with Micros, Department ABCDEF, 1620 Elton Road, Silver Spring, Md. 20903.

SEPTEMBER 24-28, NEW YORK — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 24-28, HOUSTON — **Project Management Control.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 24-28, SAN FRANCISCO — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 24-28, NEW YORK — **Structured Systems Design.** Contact: Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 24-28, WASHINGTON, D.C. — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 24-28 in Seattle.

SEPTEMBER 25, NEW YORK — **Spreadsheets Using Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

SEPTEMBER 25, NEW YORK — **Introduction to Symphony.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

SEPTEMBER 25, WASHINGTON, D.C. — **Stress Reduction and System Improvement Seminar.** Contact: Suzanne Croft, Software Corp. of America, 455 Carlisle Drive, Herndon, Va. 22070.

SEPTEMBER 25-26, ST. LOUIS — **Data Processing Management Association and Association for Systems Management '84 Conference (Datacon '84).** Contact: Datacon '84, Registration Committee, P.O. Box 1401, St. Louis, Mo. 63188.

SEPTEMBER 25-27, CARY, N.C. — **SAS Applied Time Series Analysis & Forecasting Lecture/Workshop.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

SEPTEMBER 25-27, TORONTO — **DOS/VSE Internals, Debugging & Problem Determination.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

SEPTEMBER 25-27, WASHINGTON, D.C. — **SAS Basic for Mainframes Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

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SEPTEMBER 25-28, DALLAS — **Structured Programming.** Contact: QED Information Sciences, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

SEPTEMBER 25-28, BOSTON — **Distributed Processing: Mini and Microcomputer Implementations.** Contact: Ruth Dordick, Integrated Computer Systems, Inc., 6305 Arizona Place, P.O. Box 45404, Los Angeles, Calif. 90045.

SEPTEMBER 25-28, ST. LOUIS — **Effective Communications.** Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63130.

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SEPTEMBER 26-28, ATLANTA — **The Ninth World Conference of the Association of Field Service Managers.** Contact: Wendy Kapnek, Lewis, Gihram & Kynet, Inc., The Bourse Building, Independence Mall, Philadelphia, Pa. 19106.

SEPTEMBER 26-28, OAKBROOK, ILL. — **SAS Macro Language Course.** Contact: SAS Institute Inc., P.O. Box 8000, Cary, N.C. 27511.

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SEPTEMBER 27, WASHINGTON, D.C. — **Voice/Data Integration: Issues and Answers.** Contact: Control Data Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

SEPTEMBER 27-28, NEW YORK — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

SEPTEMBER 27-28, WASHINGTON, D.C. — **Managing Software Projects II.** Contact: Data Processing Management Association Education Foundation Seminars, c/o State of the Art Seminars, Department MSP, P.O. Box 3608, Torrance, Calif. 90510.

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NEWS

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SEPTEMBER 27-28, ATLANTA — **PC Basic for DP Professionals and User Programmers.** Contact: Personal Computer Management Association, 11928 N. Earlham, Orange, Calif. 92669.

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SEPTEMBER 28, NEW YORK — **Advanced PC-DOS 2.0.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

SEPTEMBER 28, NEW YORK — **PC Communications Overview.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

WEEK OF SEPT. 30

OCTOBER 1-2, CHICAGO — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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OCTOBER 1-2, PARSIPPANY, N.J. — **Linkage Concepts & Coding.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

OCTOBER 1-2, SAN DIEGO — **X.25 and Public Packet-Switched Networks.** Contact: McGraw-Hill, Inc., 1221 Ave. of the Americas, New York, N.Y. 10201.

OCTOBER 1-2, NEW BRUNSWICK, N.J. — **Dbase II.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

OCTOBER 1-2, WASHINGTON, D.C. — **Cashing In on the Videotex Market.** Contact: Philips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

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OCTOBER 1-3, NEW YORK — **Unix Systems Internals.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

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OCTOBER 1-3, BELTSVILLE, MD. — **How to Write and Produce User Documentation.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

OCTOBER 1-3, SAN FRANCISCO — **The Information Center: Concepts, Organizations and Implementations.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

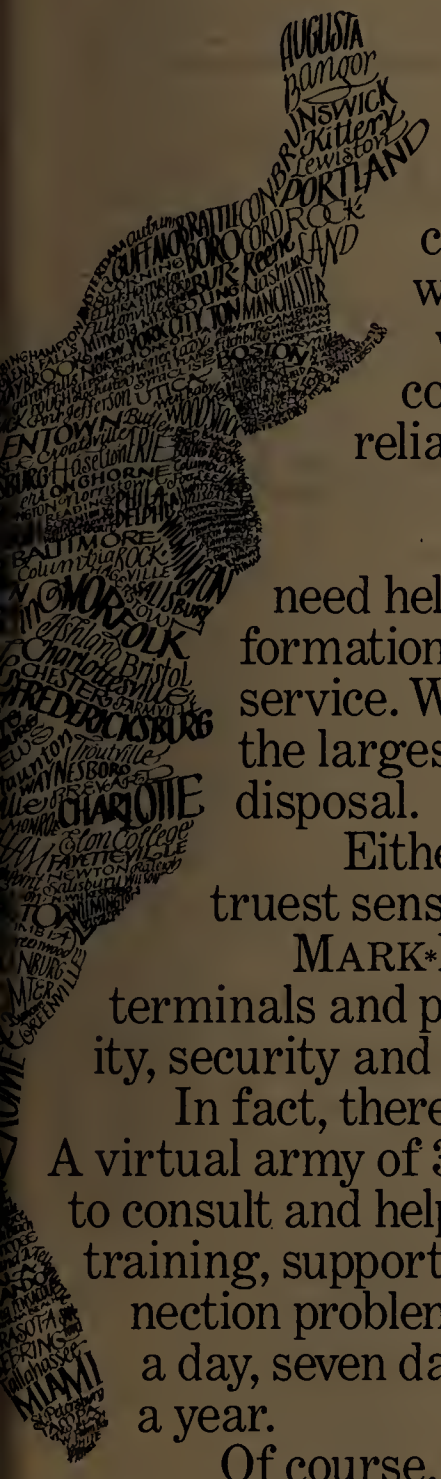
OCTOBER 1-3, HOUSTON — **Microcomputer Systems: A Guide to Selection and Application.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-3, WASHINGTON, D.C. — **DLI Application Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

OCTOBER 1-3, DALLAS — **IMS/VS Message Format Service.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

OCTOBER 1-4, CHICAGO — **The Fourth Annual Conference on Control, Audit and Security of IBM Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

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EDITORIAL

And the information center was born

A few high reflections on the recently held Information Center Conference & Exposition and thoughts on the genesis of the information center concept:

In the beginning, man created the DP shop. And darkness was upon the face of end users, for there lay between DP man, who spoke a strange tongue, and the users a vast gulf whose waters harbored treachery and foreboding.

And the users would gaze upon the gulf and the kingdom of the DP shop beyond, marveling at its great mysteries and cursing their own ignorance as they waited at the mercy of DP man for new applications.

And DP man observed *it was* good, and the users observed *this stinks.*

And as the hue and cry for more applications rose from the user shore, DP man said, "Let our shops bring forth minicomputers, lots of them, the machines yielding distributed data processing while control is still in our hands."

And the shop brought forth minis and distributed data processing, and DP man was pleased and the users were more pleased than before and Digital Equipment Corp. was *really* pleased.

But few users spoke the tongue of Cobol, and fewer still cared to learn and the vast gulf dividing the two houses again became turbulent.

For account managers demanded an ever-increasing volume of reports because, in the scriptures, it is written that information is a powerful weapon against one's enemies.

And rising executives sought more and prettier computer-generated pictures with which to impress their bosses at meetings.

And there was upon the user shores a new breed of humans, called computer literates, who dared know bytes from bites and did not fear the dark waters of the gulf like their forebears.

And there came Martin, a wizened sage who bestrode the treacherous gulf and observed the rapidly rising tide of dissent, and he observed applications backlogs whose years numbered many.

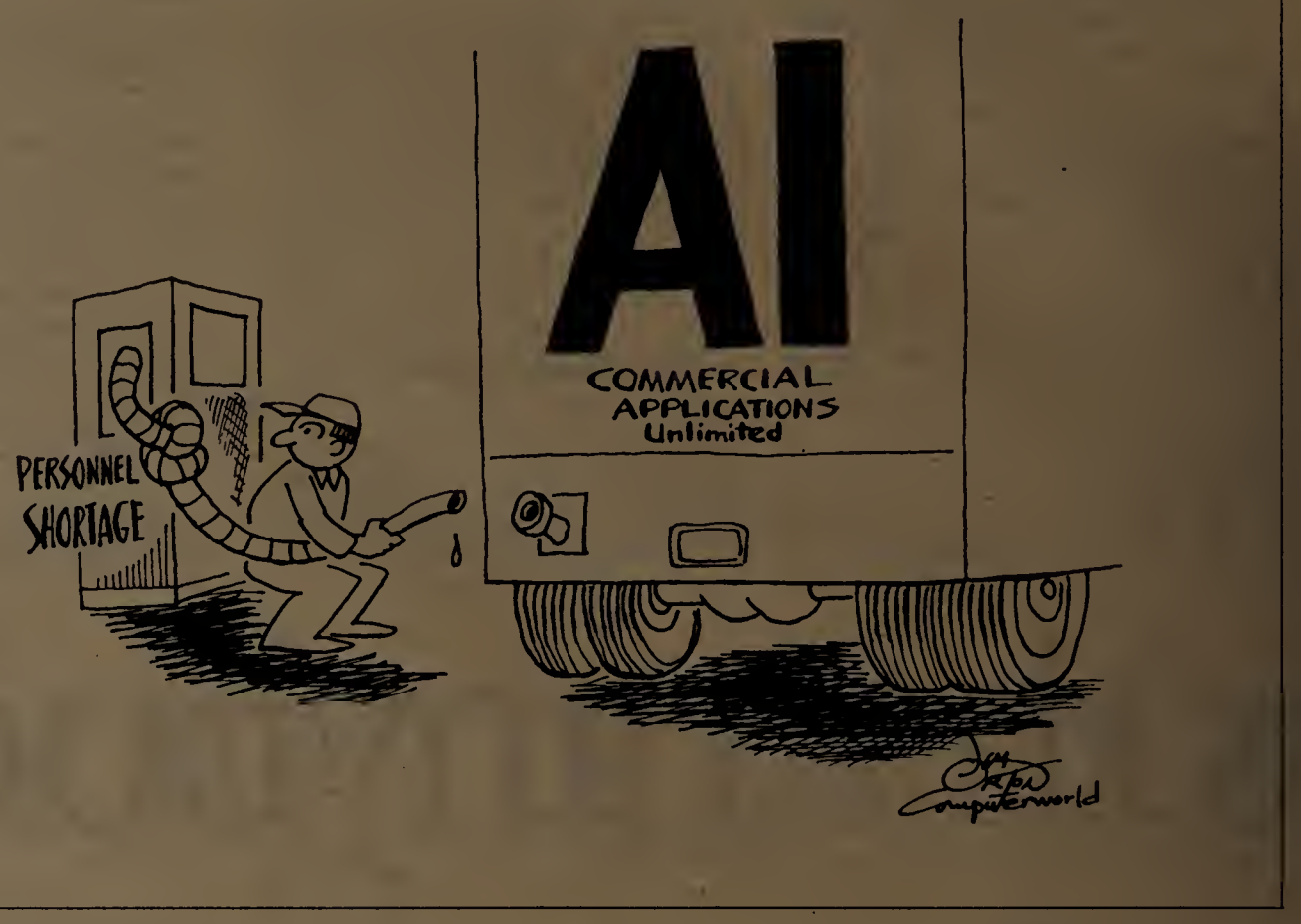
And the sage looked at the new tools called micros and fourth-generation languages and programs that spoke the forbidden computer tongue called English, heard frequently at the user shore but seldom across the gulf.

And this sage and others like him spoke to DP man in a rising chorus that said, "Yield unto the users tools to create their own applications. Let them dwell in the light of your wisdom, which shall guide them, God willing, in proper use of these tools."

"And remember," said the sages, dangling a tasty morsel in front of DP man, "in time, you'll be rid of the plague of applications backlog."

Let there be the information center.

And the information center was born and it did multiply, and although there was not universal agreement on the DP shores, it *is* good.



LETTERS

Anomalous interaction

With regard to "Computer crashes: A case of mind over matter?" [CW, June 11], I would say that there are also people who "anomalously interact" with food preparation, leading to the joke, "When he tried to boil the water, he burned it." It is for those who "anomalously interact" with computers that we build so-called "idiot-proof" programs.

People are good in certain areas, probably because they instinctively create appropriate mental models for these areas. As a result, when in doubt, they do the right thing. When the model is inappropriate, the person does subtly incorrect things that can lead to mistreatment of equipment or unexpected input to computer programs.

Peter W. Day
Atlanta

Hacking vs. trespassing

Some parallel thoughts on recent Reader's Platform pieces about computer crime legislation [CW, July 9, Aug. 6]:

Don't laws pertaining to trespassing apply to hacking? It would seem that unauthorized intrusion of private property — inadvertant or not — is pure and simple trespassing. Then again, nothing in the world of laws and litigation is pure and simple.

What about laws dealing with voyeurs?

Peter Kushkowski
Haddam, Conn.

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VIEWPOINT

The 30-lb printed page

LECHT ON SCIENCE
Charles P. Lecht

This friend of mine recently lugged his personal computer on holiday only to find on arrival that he'd wrenched his back in doing so and was unable to sit at or even lie by it without intense pain. His doctor recommended unending sitz baths and saunas to relieve this, but neither remedy allowed him to operate his personal computer.

And why was he dragging his personal computer around anyway? To edit a one-page document — a 30-lb page in a personal computer, an ounce on paper.

The entire episode got me thinking about the early days of portable TV — especially color — and the grunting and groaning that accompanied a session with their portability. After lugging the thing by its tiny handle centered on its hulking heavy frame and setting it down in a back-breaking bout with gravity, we were more likely than not to watch something that wasn't worth all the pain in its moving. I'm afraid it's going to be the same in our personal computer portable world if you're even thinking about lugging your computer home to look at documents, especially if you have access to versions on paper. For example, it's hard to provide an argument for reading project status reports on a TV tube, indoors or out, when paper versions offer so many options for the where and when of their reading — options unavailable to those who would employ a computer to do the job.

I believe that electronic media will do little more than augment paper-based means of communicating, and that in doing this, it will cause us to find new uses for books and other such traditionally paperbound things. For example, until computers were capable of aiding in the preparation and delivery of reports, the burgeoning marketplace demand for literature on how to make the newfangled things work didn't exist. And before their arrival, there was far less interest in books on, say, how to use a spreadsheet as there is now, all other things being equal.

Despite our high-tech advances in the storage and retrieval of information, no computer may be used in the sauna, the tub or on a sandy beach complete with wind and dogs. Getting your personal computer to do your bidding in these locations, with other than a good old soggy and cheaply replaceable book, magazine or what have you, just isn't in the cards for a long time to come unless, of course, you're very rich and can afford a computer company of your own to engineer a location-tolerant system to suit your needs. Since I don't foresee the forces emerging that may cause people to cease to carry their data to weird locations, it's a pretty safe bet that paper, like the Chinese junk, the Magna Charta and the skyscraper, is an enduring form — as enduring, of course, as anything gets to be on this globe. So, this means that the arrival of a paperless society will signal only that we've run out of paper, and long before this, we'll have died for lack of oxygen, so it won't matter. So

See **PORTABLE** page 52

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Use software tools to manage the data center

THE DATA CENTER
John P. Murray

As the data center function becomes increasingly complex and as the demands placed upon the operation increase, the requirement to provide the highest level of data center services possible not only continues to be an important aspect of the management of the data center, but also becomes increasingly difficult to sustain.

The heart of the data center operation is, of course, the hardware. The service level of the data center and the degree of satisfaction of the clients being served by the data center are tied to the performance of the hardware installed in the center. There are other aspects, of course, to the total issue of the data center service level, but the effective utilization and performance of the hardware, that is, *all* data center hardware, is the major component in the management of the data center.

The goal of the data center, with regard to the effective use of its hardware, must be to deliver the best possible availability and response time in a consistent manner to all classes of clients at a reasonable cost. Reasonable cost is, to some extent, a subjective issue; each organization must come to its own understanding of what is reasonable. It is possible to develop service-level cost trade-offs that can then be applied to the expense associated with the hardware. The issue comes down to what you want to pay.

There are any number of software tools available that can improve the management of the hardware within the data center and that, as a result of that improved management, help deliver the required services at a reasonable cost. The use of these tools should be investigated, and where their use is deemed appropriate, they should be incorporated within the data center operation.

There are a number of software tools that can improve the management of the hardware within the data center and help deliver services at a reasonable cost.

Some of the general areas where this software can prove beneficial and where its use should at least be considered are as follows:

- Hardware utilization and charge-out packages. You must know what is going on in the system if you are to manage it.
- Software to manage and monitor the communications network. As more players enter the business of providing communications services, it becomes more critical that facts are available about what is going on in the communications lines.
- Disk management software. A good package can find additional disk space and allow improved overall management of the direct-access storage device.
- Tape management packages. The avoidance of only several serious tape handling errors will return the cost of this software.
- An automatic production scheduling system. If you are in a complex operational environment, it can be beneficial. I would first make certain the data control function is sound.

In most cases, the expense associated with the installation of these software packages is reasonable, particularly in light of the improvements they can provide to the overall operation of the data center. If your data center is experiencing difficulty in any of these areas, it should not be too difficult to build a factual case to support installation of the software. The approach is to cite specific examples of the problems being encountered because you do not have the appropriate software controls. It should not be too difficult to place a dollar fig-

See **CENTER** page 53

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*



Grace Hopper: Conscience of the industry

By Paul Gillin
CW Staff

She tottered up to the podium looking as though a hard stare from someone in the front row would knock her over. But when Commodore Grace Hopper began to talk, her voice was as strong as a trumpet flourish.

Hopper, who spoke at the recent McCormack & Dodge Corp. Seventh Annual User Conference, should be declared the official conscience of the computer industry. At 78, she is as sharp as any of the so-called "experts," but unlike the experts, she has no particular financial interest in promoting one technology or another. That attitude is refreshing in an industry in which just about everyone is trying to make a buck.

Hopper travels extensively, speaking to every flavor of audience from high school students to high-powered industry executives. Her wide-ranging, spirited talk contains kernels of insight for everyone. Hopper calls herself "the third programmer on the world's first electromechanical computer" (Harvard University's Mark I), but her message is light on nostalgia and heavy on current issues.

Anyone who relies on computers for a living should listen closely to what Grace Hopper has to say. Clearly, the field is poised for incredible growth, the kind which Hopper believes will make it the largest industry in the country by the end of the century. But she believes lack of standards and reluctance to adopt new ideas could send it careening into chaos just as quickly.

Hopper draws a parallel between the current state of the computer industry and the auto industry of the early part of the century. Microcomputers are the Model Ts of computing, she said. Like the early automobile, they are inexpensive and easily available. Just as Henry Ford offered the Model T in any color as long as it was black, the industry leader offers any color micro as long as it is blue, she said.

See **HOPPER** page 53

Gillin is a senior editor at Computerworld.

VIEWPOINT

PORTABLE from page 51

much for the use of the computer as a report media, for the time being. Anyway, they'll have to get a lot lighter before I lug one around for reading and writing.

For those of you who, on reading this, still feel compelled to carry your personal computer around instead of a few sheets of 8½ by 11-inch paper, good news is on the way.

The personal facilities needed to create a report that cannot be paperbound are arriving. These involve animation, something that cannot occur on paper no matter how fine may be its quality. The capability to create an animated report and ship it over a local-area network to your boss' personal computer is arriving, and I, for one, am tickled pink. It overcomes a major hurdle we encounter in reporting our thoughts in book format; the message we wish to convey may defy description without the help of pictures — and moving pictures to boot.

Before these days, your average business guy, the Lord knows that's most of us, didn't have access to the artists, film directors and teams of doughnut-munching and coffee-sipping technicians it took to make a movie in the process of creating a report to management. Anyway, few of us have the patience or skill to deal with it all even if we did. They say that a picture may be worth a thousand words, but dealing with some artists I know makes the price too dear to pay. And our experiences in dealing with an entire movie crew to produce 16 frames a second, or anything for that matter, would make even a Purdue University graduate take to the pen or keyboard to write, as radical an idea as this may be.

The personal facilities needed to create a report that cannot be paperbound are arriving. These involve animation, something that cannot occur on paper no matter how fine may be its quality.

Book format

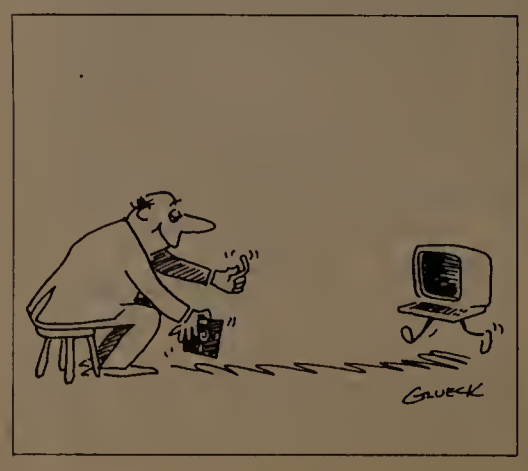
So until now, most reports were prepared in book format, and the thousands upon thousands that appeared daily represented our final surrender to mediocrity and its companion, boredom. Even if electronically stored, their retrieval brought to the face of the digital display nothing less than our old friend the book, but no longer portable. As the great Jimmy Durante would have said, "What a revolting development." It conjures the image of Capt. Kirk of *Star Trek* decomposing to be beamed through space in a stream of electrons, mesons, quarks and goodness knows what else, and after solving all the problems Einsteinian space may offer, recomposing and delivering a telex message — engraved in stone, yet.

If a computer is to be employed as a report media, it should be in a way that brings those of its powers to bear otherwise unobtainable. One thing you can't get in a book is animation, unless you read dumb comic strips with unconvincing cartoon characters absurdly portraying things like military strategy during thermonuclear war. Enter the personal animation system with a library of persons, places and events to make our computers justify their being lugged around and exposed to the hazards of daily living.

Architectural plans that include the actual growing of buildings through animation and words are making their appearance with ever-increasing regularity. And new packages are emerging that will allow for the integration of animation with word processing and, ultimately, image processing to provide us with an incredibly expanded means of communicating our thoughts.

Now I'm not suggesting that everyone with a personal computer who writes will want to include animation in his report, but its availability marks the beginning of an era during which so many great things in the way of report writing will become possible that it deserves our attention. The storage of a library of digital images of the things we talk or write about and the means to animate these personally and to include the animation in our reports are here. Creating a user-friendly interface has yet to be done, but in comparison with what has been accomplished so far, it's a mere detail.

The respective roles of the computer and the business report in book format are still being defined, but they become clearer when animation is involved. The methods that may be employed to convey information through animation are as endless as may be the human imagination. Lugging a personal computer around to use animation facilities may well be worth it. Until then, give me paper.





VIEWPOINT

HOPPER from page 51

The unbridled spread of single-user machines will cause the same kinds of problems that the wash of autos has created, Hopper said. Just as our nation's railways and mass transit systems have crumbled under the pounding of radial tires, so we are proceeding into the information age without a plan or a goal. That worries Grace Hopper very much.

Hopper said the industry needs standards, not just for programming languages but also for computer architectures, data structures and networks. Lack of standards costs the government $450 million a year in hardware and software that is scrapped due to incompatibility, she said. She believes standards cannot be set arbitrarily by a dominant company; they must be hammered out by a consortium of vendors or, if necessary, by the computer industry's largest customer: the government.

Hopper knows about standards. She was instrumental in the development of the first Cobol compiler in 1959. In 1967, she was called back from retirement to coordinate a U.S. Navy effort to standardize Cobol and Fortran compilers across the military. The work of her group now serves as the basis for government standards of Cobol, Fortran, Basic and Ada.

The industry is also hamstrung by a misguided belief that bigger processors are necessarily better processors, she asserted. If you can't move a big, heavy boulder with one ox, you don't grow a bigger ox, she said; you just add another ox. Similarly, large volumes of data are not better handled by a bigger machine; they are better managed with multiple machines, each doing a specialized task.

Networked computers are the wave of the future, Hopper believes. Computers are not made to search data bases. Data base machines offer tremendous potential as managers and summarizers of information that can be fed into efficient processors. If you aren't thinking about data base machines and networked computers, you are in for big trouble in the future, Hopper said.

Hopper also worries about what we are doing with the huge volumes of information we now process. She believes we are disseminating information without bothering to learn how to use it. Both important and outdated information live next to each other in data bases. We are becoming binary pack rats, so obsessed with analyzing every scrap of available knowledge that we are even willing to pay the price of excessive program overhead and slow response times.

Bane of the business

Poor programming is a bane of the business, the industry's first lady said. Hopper's curiosity was aroused once when she was criticized for wasting five microseconds (millionths of a second) in a program. Noting that computers today deal in increments of nanoseconds and picoseconds — or billionths and trillionths of a second — she held up a piece of copper wire 11.8 inches long. "This is the maximum distance an electrical current can travel in one nanosecond," she said. She extracted a thick coil of wire from a plastic bag. "This is how far it travels in one microsecond. This should be hung over every programmer's desk, preferably in the shape of a noose."

Cheap memory and processing power are no excuse for poor design and inefficient coding, she said. In the future, we are going to need every ounce of computer power.

The computer industry is rooted in the past and afraid of the future. The phrase "That's how we've always done it" is the most poisonous in the field. Ironically, the lady in the Navy uniform used every opportunity in her speech to showcase the achievements of computer pioneers who have bucked military authority and struck out on their own.

"The best piece of advice I can give you is 'Do it.' It's always easier to apologize for something you've already done than to get approval for it in advance."



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CENTER from page 51

ure on these problems to justify the expense of the software.

Selecting the best package or set of packages for your particular installation is not any different than it is with the selection of any other data center item. The first step is to define your requirements and then select vendors who can meet those requirements. The next step is to talk to those who have installed the product to find out what their experience has been; this will allow you to identify and eliminate the weak candidates. Some of the vendors will provide a 30-day trial; if that is an available option, it should be pursued.

Astute data center managers will take the time to investigate the available products and to push to select and install those products that can produce benefits for their installations. The process of managing the data center will not grow any less complex in the future, so you need all the help you can get. These packages offer that help.

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SOFTWARE & SERVICES

SOFTLINE
Frank Sweet

Charting the path to management

Many bright systems analysts will seriously damage their own careers this year by choosing a wrong turn in the perilous path to management.

Managers do not have time for technical details, they rightly observe. "So to become a manager I may safely become technically obsolete," they wrongly conclude. Using the boss as a role model, they see the trappings of authority, the socializing with higher-ups and the delegation of decisions. What they fail to perceive is the need to keep technically up-to-date.

The result is a staggering casualty rate among our newly commissioned officers. We see an unending stream of affable young men and women who are promoted, given private offices and then blown away by the first strong wind. Computer professionals are uniquely prone to obsolescence. Bluntly, we risk more because technology changes faster here than in any other field.

Let us inspect some of the causes and consequences of technical obsolescence among first-line development managers. First though, let us understand why people choose programming as a career and why they seek management as a long-term goal. Then we will see that obsolescence happens when technicians misread what it takes to get ahead. Socializing is necessary, but it is not sufficient. Finally, we will examine the curious fact that women risk more for less reward than men.

Why choose DP MIS? "That's where the money is," gangster Willy Sutton is said to have answered, when asked why he robbed only banks. Similarly, the public perceives our field as one that pays better than most. They are right. Few sights depict the economics of supply and demand as vividly as a personnel staffer trying to grasp why a trainee programmer must be offered $28,000 a year. It pays well because surprisingly few have the knack for it. After 20 years of training programmers, I have concluded that only one out of every five starters has that knack.

Will the next generation fill the need? I am afraid not. There is little hope that the spread of home computers and video games will produce a computer programming generation. Computer camp counselors report that most kids spend their time learning to play games, not learning to program. But prove it to yourself; visit your local shopping mall next Saturday. The video game room is within sight of Radio Shack. Count the number of youngsters playing mindless games. Then see how many are trying to pro-

See **FAIL** page 80

Sweet has 14 years of data base experience. Currently he is corporate manager of data administration for The Charter Co. in Jacksonville, Fla. He is a regular contributor to Softline.

Infotym introduces 'Reveal' decision support system

By John Gallant
CW Staff

CUPERTINO, Calif. — Infotym is hoping to make some new waves in the crowded waters of the decision support system (DSS) software market with the introduction of Reveal, a package said to combine expert system technology with standard DSS tools.

A spokesman for Infotym said the Reveal system allows the expertise of individuals to be captured in a knowledge base that can be accessed and manipulated in conjunction with the package's DSS tools for modeling, analysis, programming, data base management and report generation. Thus, Reveal reportedly can address applications ranging from quantitative modeling to expert system development.

The spokesman said the system operates in a virtual machine environment, allowing users to transport applications among the computer systems on which Reveal operates. The package is currently available for IBM 370 architecture mainframes under IBM's VM/CMS operating system; IBM Personal Computer XTs under IBM's PC-DOS; ICL, Inc. processors under VME; and Digital Equipment Corp. VAX-11 systems under VMS.

Users reportedly can switch between the mainframe and the Personal Computer XT when processing applications and utilizing modeling capabilities. That capability allows a user to log on to the mainframe from the Personal Computer XT and download a portion of a relevant data base.

Infotym, a division of the Information Systems Group of McDonnell Douglas Automation Co., is attempting to carve out a unique niche between the older DSS software and the rapidly growing expert system development tool markets with Reveal. The company is the latest entrant in what some analysts claim is an already saturated large systems DSS market, which has not seen new participants in recent days.

Reveal is said to work by providing a DSS that allows users to build models with English-like statements representing subjective knowledge. That expert system programming environment offers a facility to identify sets of criteria in the models and express them in a linguistic and approximate form to capture broad policy guidelines.

The spokesman said programming is done in Infotym's Reveal language, which allows the user to make declarative statements expressing factors of policy as well as specifying conventional algorithms and procedures. Reveal contains its own text editor, which can be used to input and modify Reveal programs and which exam-

See **DSS** page 78

Fourth-generation tools slash highway patrol's 10-year system design backlog

By Robert J. Bradley
Special to CW‡

In 1973, the Information Systems Division (ISD) of the Missouri State Highway Patrol completed its first long-range plan for future systems development. The catalog of future projects submitted by users was staggering.

The Highway Patrol's command staff and ISD decided that any future acquisitions of data processing facilities had to be related not only to processing performance, but to increasing staff productivity. It has only been in the last few years that we have made a formal analysis of productivity.

The problem of back-logged systems projects surfaced again after a review of the 1980 plan. At that time, the backlog was 10 years for the current staff.

The Highway Patrol operates a large telecommunications network which provides computer services to criminal justice agencies throughout Missouri, as well as interfaces with the National Law Enforcement Telecommunications System in Phoenix and the Federal Bureau of Investigation's National Crime Information Center in Washington.

Most applications are traditional data base systems. All file maintenance is performed in real-time from remote terminals, and a substantial portion of the applications are processed in the store-and-forward mode due to the computer interfaces to several regional, state and national networks.

The computer center operates around the clock. The monthly work load is made up of approximately six million I/O transactions and 22,000 batch-job steps. There are 36 separate on-line systems comprising 290 data base files and about 1.6 million lines of code. The total staff of the ISD is 72, including 11 systems analysts and 14 application programmers.

The problem of back-logged systems projects surfaced again after a review of the 1980 plan. At that time, the backlog was 10 years for the current staff. This was disturbing for two reasons: First, we had acquired several facilities for improving productivity, and second, a thorough review of the development process did not reveal any areas where time was being wasted. Programmers were writing code faster than ever; systems analysts were documenting more thoroughly than ever; and user involvement was adequate.

The review of the 1980 plan convinced us that the current approach was sound except that more time was required in the user area, which would increase overall project time — not reduce it. As a result, we concluded that the best target for im-

See **TOOLS** page 76

Bradley is director of the Information Systems Division of the Missouri State Highway Patrol in Jefferson City, Mo.

■ Intel Corp. has announced Release 3.0 of its System 2000 data base management system for Sperry Corp. and Control Data Corp. mainframes/**56**

■ A new batch teleprocessing monitor has been introduced by Sterling Software Marketing/**56**

■ American Management Systems, Inc. has released deposits and accounting software for banks with large corporate accounts/**56**

■ Harris Corp. has announced software that allows its computers to function as data base servers/**58**

■ A screen painter is among the new features of Applied Data Research, Inc.'s Roscoe Version 5.3A/**58**

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Intel System 2000 release out for Sperry, CDC mainframes

AUSTIN, Texas — Intel Corp. has announced Release 3.0 of its System 2000 data base management system (DBMS) for Sperry Corp. and Control Data Corp. mainframes.

According to a spokesman, System 2000 Release 3.0 for Sperry mainframes features an enhanced version of Screen Writer, a fourth-generation language extension to Intel's Quex query and update facility. The enhanced Screen Writer allows users to create screens and join them with transaction logic.

Another System 2000 enhancement for Sperry processors is the COLLECT command for the DBMS's Self-Contained Facility (SCF) Quest language. The command lets users create subsets of the data base known as collect files, which are relational tables containing rows and columns created by specifying the names of items in different data bases. A MOVE TREE command was also added to the Sperry version; this allows users to move an entire data tree from one logical position in a data base to another area in the same data base.

System 2000 Release 3.0 for CDC mainframes includes a Where clause feature, which enables a program to use SCF Quest where-clause syntax to select a data base subset for retrieval or update. Other enhancements include the MOVE TREE command and Ansi Fortran 77 support.

The price of the basic System 2000 Release 3.0 software is $70,000.

Intel's System 2000 Customer Marketing Department may be contacted through P.O. Box 9968, Austin, Texas 78766.

AMS unveils bank packages for IBM 4300 series processors

ARLINGTON, Va. — American Management Systems, Inc. (AMS) has announced the Corporate Deposits System and the Corporate Accounts Analysis System for users of IBM 4300 series and larger processors under IBM's MVS and DOS/VSE.

According to a spokesman, the products are designed for banks with more than $2 billion in assets and substantial deposits from corporations.

The packages are said to provide account history information on up to 13 months of daily balances, detailed transactions and stop payments; automatic account transfers at fixed or variable amounts keyed to book, available or collected balances; full interest-sensitive accounting, including back-valued adjustments; and comprehensive customer service analysis covering deposit-related and other services.

AMS's Corporate Deposits and Corporate Account Analysis Systems are fully integrated and are scheduled for delivery in the fourth quarter, the vendor said. The packages are available at a combined price of $500,000.

More information is available from AMS, which is located at 1777 N. Kent St., Arlington, Va. 22209.

Sterling offers on-line batch monitor

SACRAMENTO, Calif.— Sterling Software Marketing, a subsidiary of Sterling Software, Inc., has introduced an on-line batch teleprocessing monitor that is said to support concurrent data transmission between a host mainframe and remote computers, including minicomputers, micros and remote job entry stations.

Supertracs reportedly allows data collection and data transmission to different remote sites on different lines and performs multiple data collections and data transmissions during a single connection on switched or nonswitched lines.

The host site can initiate the transmission of the data to remote sites, or the remote site can dial in to Supertracs, which can automatically download the requested data, according to the vendor.

Data received by Supertracs can be extracted for mainframe processing or held for transmission to other remote sites.

It provides both data and access security and has the ability to validate the remote identification and to verify the application identification, preventing unauthorized access from remote locations, the vendor said. Autodial capabilities provide additional security.

The teleprocessing monitor is said to support all releases of IBM's OS and DOS, as well as cash management lock-box processing, automated clearinghouse, electronic mail and point-of-sale data collection.

The base price for the monitor is $15,000 for the OS operating system and $12,000 for DOS, according to the vendor.

Additional information is available from Sterling Software Marketing, which is located at 1007 Seventh St., Sacramento, Calif. 95814.

This company has managed more than 7000 Computer leases.

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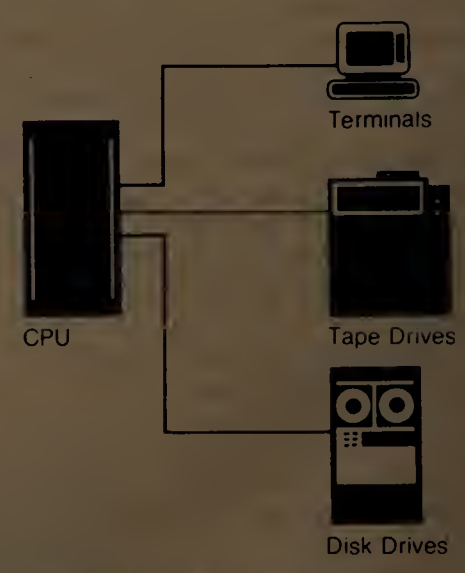
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The Terms Revealed

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A major metropolitan newspaper chose NOMAD2 because of its superior data manipulation and reporting facilities.

A well-known sportswear manufacturer chose NOMAD2 because it ideally meets the company's unique and extensive sales analyses requirements.

One of the largest marketers of nuclear fuel chose NOMAD2 because it offers a common syntax in a single environment.

A national research-based organization chose NOMAD2 because its overall flexibility allows NOMAD2 to mirror the financial characteristics of the company.

A major manufacturer of office furnishings chose NOMAD2 for two reasons—the ease with which it responds to end-user requirements, and our on-going support.

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ADR offers enhanced 'Roscoe' release

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 5.3A of Roscoe, its on-line program development system for IBM OS/VS environments.

According to a spokesman, the major enhancement offered in Release 5.3A is a system, dubbed Sketch, that simplifies the creation and maintenance of panels used by IBM CICS application programs. Sketch was implemented using the Roscoe Programming Facility (RPF). Through system prompts, it allows a user to paint panels and define fields in a panel.

Sketch then automatically generates the appropriate CICS Basic Mapping Support (BMS) macros, accorting to the vendor spokesman.

Sketch is said to be fully integrated with Roscoe; it also accepts existing RPF panels and converts them into BMS format. Users can prototype entire applications using Sketch. Sketch is also integrated with ADR/DL, ADR's interactive application development system for CICS, IBM's IMS/DB/DC and ADR/Datacom/DB application programs. ADR/DL uses Sketch to build panels for CICS applications.

In addition, Roscoe's Extended Time-Sharing Option (Etso) has been enhanced to provide greater flexibility in the execution of programs. Etso now supports concatenated data sets, sysout files and programs that utilize authorized system functions. Also, Roscoe terminal users can dynamically alter their terminal's presentation size, redisplay the last command executed and use the Attention key on IBM Systems Network Architecture 3270 terminals.

Release 5.3A of Roscoe is available for IBM 370, 30 and 4300 series processors at a permanent-license price of $52,200.

More information is available from ADR, Route 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Harris links supermini, Oracle DBMS

FORT LAUDERDALE, Fla. — Linking Oracle Corp.'s relational data base management system (DBMS) and Harris Corp. superminicomputers, the Computer Systems Division of Harris has announced its Oracle back-end data base server, which is designed to boost data base productivity with auxiliary computer power.

According to a spokesman, the back-end data base server is composed of the Oracle relational DBMS running on Harris supermini systems. The Harris back-end data base server allows users to offload intensive queries from the main computer to a dedicated data base computer. Data base queries are automatically channeled to the dedicated back-end computer, which returns responses so that the main computer can concurrently handle other interactive users, a spokesman said.

The spokesman said that with the Harris/Oracle back-end computer tandem, data base user response is faster,

See **HARRIS** page 60

Micro-to-mainframe:
Before you settle for a simplistic solution, ask a few serious questions.



Choosing a micro-to-mainframe communications system is no game.

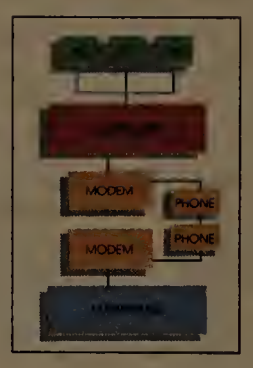
So before you toy around with "easy" solutions, ask some serious questions.

Will this product support full IBM Terminal Emulation?
Make sure the system can emulate remote batch and interactive IBM terminal systems.

Does the company offer a variety of products?
You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.

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Insist on toll-free access to qualified service personnel before and *after* the sale.

What if I need a quick analysis of a problem?
Ask if the manufacturer has a Communications Test Center for product testing over public phone lines. And find out if the system has internal diagnostics.



Suppose something goes wrong with the unit?
The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.

What about future product development?
Make sure the products you're going to need soon will be available soon.

Who am I dealing with anyway?
How long have they been in business? The longer, the better.

How much is all this going to cost?
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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

SOFTOUCH SYSTEMS
CICS-Juggler Release 2.1

Softouch Systems has announced Release 2.1 of its CICS-Juggler utility. CICS-Juggler is a software aid that allows IBM 3270 series physical terminals running under IBM's CICS to be defined as up to nine logical terminals, each capable of running any on-line CICS task, the vendor said.

This software is available for IBM's DOS Releases 1.5 and 1.6 and OS Releases 1.5 and 1.6.

Release 2.1 adds a windowing feature that allows up to four windows to be displayed at one time. Operators move from one logical terminal to another by pressing a single user-defined key. CICS-Juggler requires no additional hardware or ports and requires one link-edit and two CICS table entries, according to the vendor. Access to the logical terminals does not exceed the security level of the operator who signed on the physical terminal.

Prices are $2,500 for the DOS version, with optional annual support at $300, and $3,500 for the OS version, with optional annual support at $500.

Softouch Systems, 8265 S. Walker St., Oklahoma City, Okla. 73139.

DATA GENERAL CORP.
Intrinsic Instruction Set

Data General Corp. has announced an enhancement to the Eclipse MV/10000 superminicomputer called the Intrinsic Instruction Set (IIS) that is said to increase processing speed by more than 20%.

The IIS is a set of microcode instructions that perform commonly used trigonometric and algebraic functions, such as sine, cosine and square roots, which previously had to be done in assembly language, the company said.

Use of the microcode option reduces instruction execution times in the 32-bit system such that computational performance increases to 2.95 million instructions per second (Mips) from 2.5 Mips, the company said.

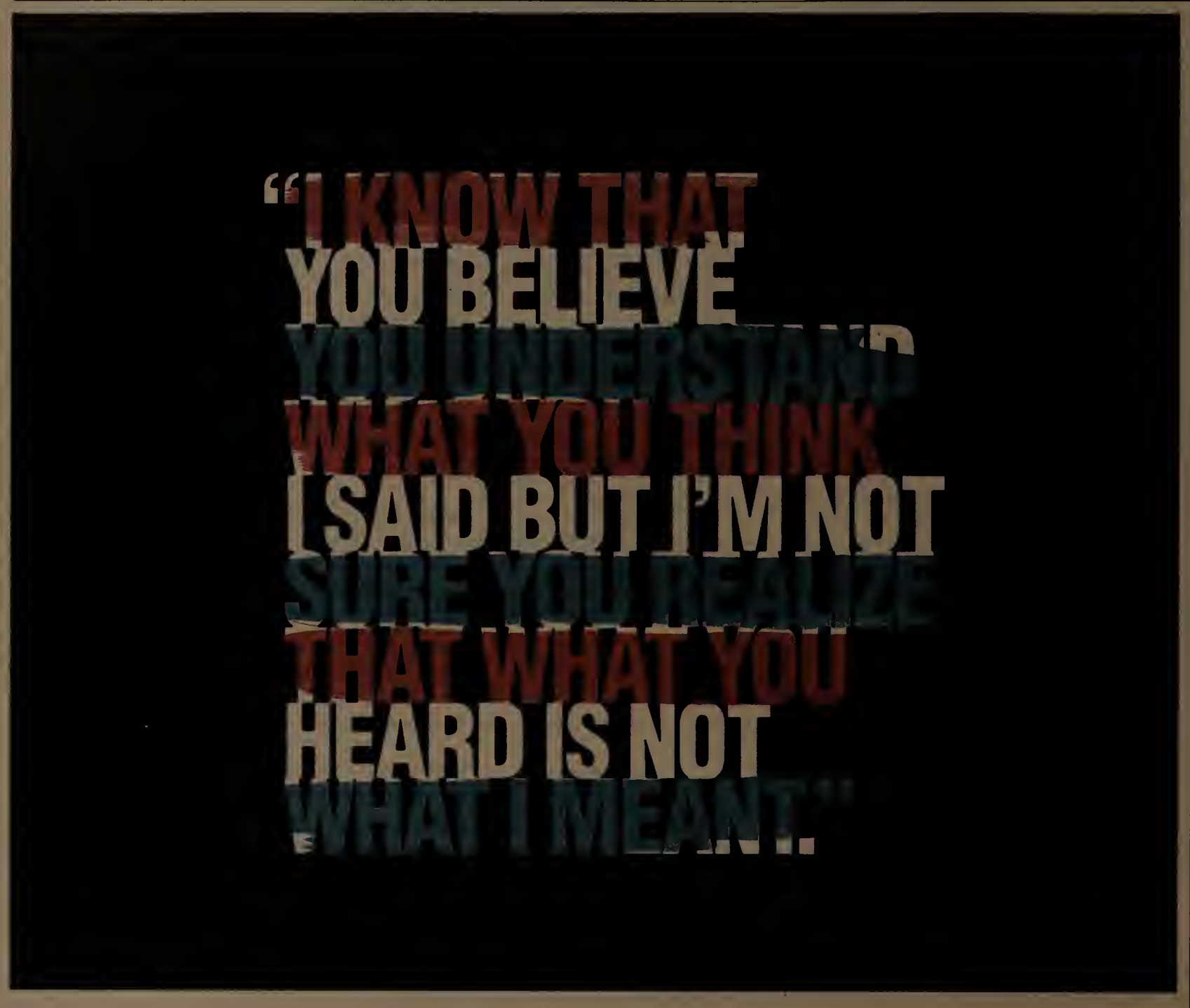
The IIS enhancement will be available to users of existing MV/10000s for $225 and at no charge to purchasers of new MV/10000s with the Writable Control Store (WCS) option, the company said. The price of the WCS option, which is said to provide additional space for user- or Data General-developed intructions, is $10,000. First shipments of the IIS, which is delivered on magnetic tape, are scheduled for November, the company said.

Data General, Technical Products Division, 4400 Computer Drive, Westboro, Mass. 01580.

UNIQUE AUTOMATION PRODUCTS
UAP-Link for DG AOS/VS

Unique Automation Products has announced expansion of its UAP-Link file transfer software family to include Data General Corp.'s AOS/VS operating system. This release permits IBM Personal Computers, Digital Equipment Corp. Rainbow microcomputers, DEC's RSX and RT-11 operating systems and S & H Computer Systems, Inc.'s TSX-Plus operating system to transfer binary and text files with the DG

Continued on page 64



The problem with language is English.

The source of most errors in the field of systems and software engineering today is the way in which system requirements and design specifications are written. With a combination of pencil and paper, English, a few graphs and some math, the engineers who develop the specifications are, many times, the only ones who know what they're talking about. And the problem is the ambiguity of the English language.

That's why Teledyne Brown Engineering developed IORL®, The Input/Output Requirements Language. IORL is a system requirements and design language that allows the engineer to communicate specifications and designs in a precise, unambiguous manner. While other design languages have made compromises in the English language, IORL has made none. It is comprised of graphical engineering symbols, mathematical expressions, Latin, and the Greek alphabet, all known quantities to systems engineers. The ambiguity of English never comes into play.

And now IORL has become the cornerstone of the most advanced systems engineering package in the industry...TAGS™, Technology for the Automated Generation of Systems, developed exclusively by Teledyne Brown Engineering.

TAGS is the first automated system designed specifically for the field of systems/software development in order to give computer aided design (CAD) capabilities to the systems engineer. In addition to the IORL language, TAGS consists of a series of software application packages that give the systems engineer the ability to harness the computer to automate and aid in the design, documentation, testing and maintenance of complex systems.

The dramatic cost reductions, accuracy and confidence factors that can be achieved through the use of TAGS and the IORL language hold the promise of revolutionizing the field of systems and software development.

This most necessary approach to systems/software engineering is available to you today by calling or writing: TAGS/IORL Marketing, 300 Sparkman Drive, Cummings Research Park, Huntsville, Alabama 35807. 1-800-633-IORL (Toll Free).

TECHNOLOGY FOR THE AUTOMATED GENERATION OF SYSTEMS

TAGS

TELEDYNE BROWN ENGINEERING

HARRIS from page 58

because a separate supermini is dedicated to serving data base queries. Response is also improved for other users on the main computer, who do not have to contend with the data base for CPU time. Harris reportedly utilizes the two-task data base capability of Oracle, which allows the DBMS kernel, or back end, to run on one machine, with the front end on another.

Multiple users can access one back-end data base server in a local or remote connection, or several computers gathering data can feed it to one Harris/Oracle back-end system.

The Oracle back-end data base capabilities are available from Harris' Computer Systems Division. They are priced at $25,000 for the Oracle back end (DBMS kernel) and $15,000 for the Oracle front end. Harris superminis range in price from $38,000 to $250,000.

More information is available from Harris Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

COME SEE FOR YOURSELF DUNSPLUS: THE MICRO SOLUTION THAT REFLECTS THE WAY YOU DO BUSINESS



Don't just take our word for it. Attend one of our nationwide seminars, "Innovations in End-User Computing," and judge for yourself. We'll show you how DunsPlus responds to your business demands without creating demands of its own.

What will you see at this seminar? We'll show you how DunsPlus has given the IBM PC XT a built-in business environment—an adaptable business environment.

You'll see how easy it is to work with this menu-driven system. How single-button fast it is to access widely accepted software, like 1-2-3 from Lotus, MultiMate and Western Union electronic mail, already incorporated into DunsPlus. How easy? No DOS, no typing skills, no frustrating documentation.

And you'll see how DunsPlus gives you full flexibility to tailor its environment to your precise business needs. Add any variety of software and customized applications. Link DunsPlus to virtually any mainframe. You will see how DunsPlus can slip smoothly into the way you and your organization do business.

If your business demands answers, not claims, look at DunsPlus.

Innovations in End-user Computing Seminars are being held each month in these locations:

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For dates or more information, including locations of additional seminars, call today: **800 DNB-PLUS.**

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1-2-3 is a registered trademark of Lotus Development Corporation. MultiMate is a registered trademark of MultiMate International, Inc. IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a registered trademark of DunsPlus, a company of the Dun & Bradstreet Corporation.

TODAY'S VAX FAMILY: UNPRECEDENTED COMPATIBILITY FROM THE DESK TO THE DATA CENTER.

Digital's VAX™ systems have earned an enviable reputation as the best-engineered computer family in the world. Since their introduction, VAX-11/730, VAX-11/750, VAX-11/780 processors and VAXcluster™ systems have set the industry standard for processor-to-processor compatibility.

Now VAX system compatibility has been extended to unprecedented proportions, with the addition of the new MicroVAX I™ and VAX-11/725 systems at the low end, and the new VAX-11/785 system at the high end. Software is completely compatible; VMS,™ a multi-user, multi-tasking virtual operating system, runs on every VAX processor. This means you can apply compatible processors – with compatible architecture, data registers, file structures, languages, utilities and networking options – to an incredible range of applications. VAX system compatibility includes UNIX™ software environments, too. In fact, Digital's VAX computer line is the first 32-bit computer series in the world to support a virtual memory implementation of UNIX software. And Digital's ULTRIX™ operating system gives you a single source UNIX software solution optimized for VAX system performance.

Within the VAX computer family, compatibility can range from systems that fit on a desktop and economically support a single user to systems that occupy a data center and can effectively handle the workload of your entire organization. In short, Digital's VAX computer line is the best-engineered in the world, encompassing the widest range of compatible processing solutions. So it's no wonder that VAX systems have become the most popular 32-bit computers.

THREE NEW EXTENSIONS ENGINEERED FOR WIDE-RANGING SOLUTIONS.

The MicroVAX I system is the VAX processor for microcomputer applications. It is cost-effective enough to dedicate to just one user or process. But it's powerful enough to handle many demanding tasks because the MicroVMS™ operating system gives you the same utilities, development aids and languages as the full VMS operating system.

The VAX-11/725 system is designed for the office. It is so compact it can fit under a desk. Yet it runs full VMS software, and can support up to eight users. Plus it's quiet and requires no special air conditioning. It's the VAX system to choose when your applications require more memory and storage capacity than the MicroVAX I system offers today.

The VAX-11/785 system, our latest top-of-the-line VAX computer, is the highest performance processor of the VAX computer family. Cache is a full 32 thousand bytes, a special advantage if your programs contain many complex subroutines. There's also an optional floating point



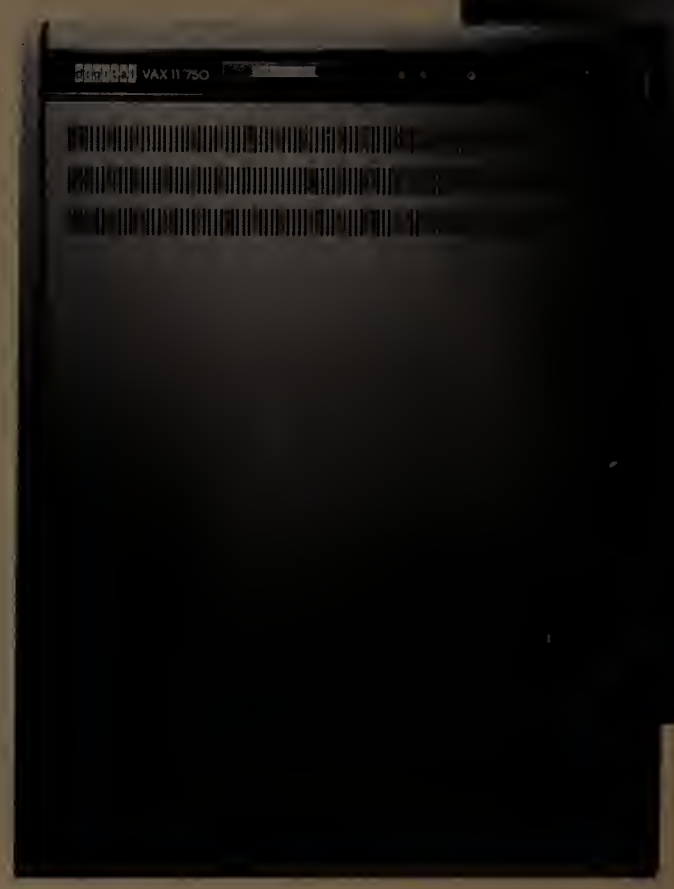
MicroVAX I



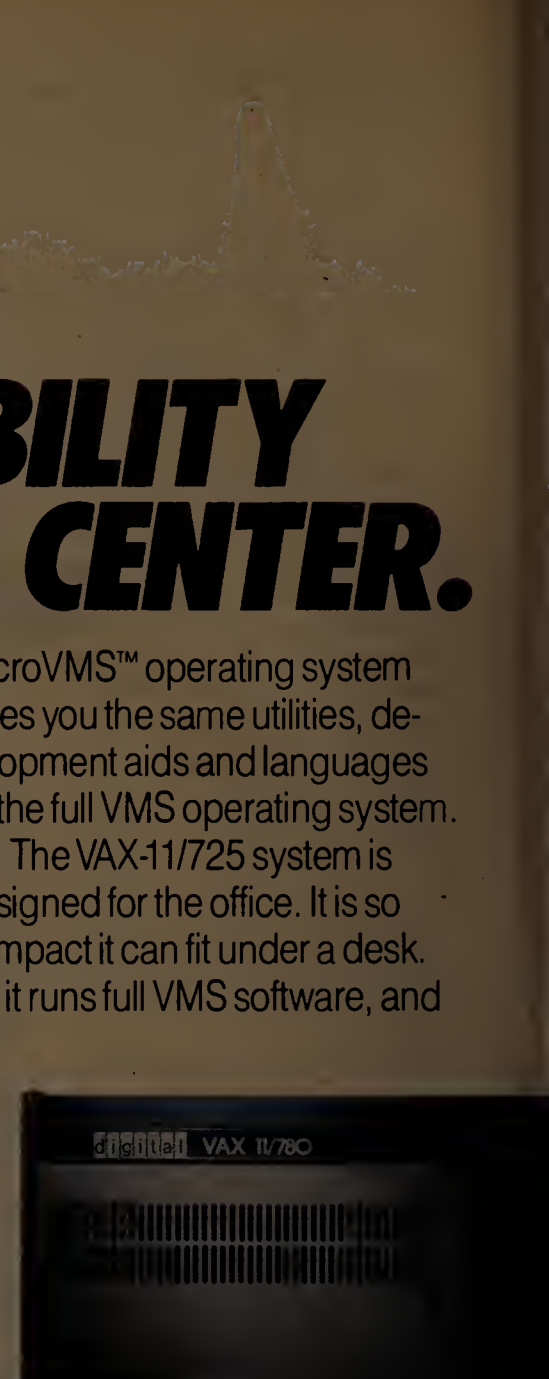
VAX-II/725



VAX-II/730



VAX-II/750



VAXclusters

VAX FAMILY COMPATIBILITY

TODAY'S VAX FAMILY.

MicroVAX I, VAX-11/725, VAX-11/730, VAX-11/750, VAX-11/780, VAX-11/785 and VAXcluster systems.

OPERATING SYSTEMS.

VAX processors support VMS and ULTRIX operating systems.

INFORMATION MANAGEMENT.

VAX systems support the VAX Information Architecture, which includes the VAX DBMS CODASYL database, VAX Rdb relational databases, the Common Data Dictionary, DATATRIEVE™ query language and application generator, DECgraph™ business graphics software, DECslide™ 35mm slide generator, VAX VTX™ videotex system, FMS™ Forms Management System, TDMS Terminal Data Management System, and ACMS Application Control and Management System.

PROGRAM DEVELOPMENT.

VAX systems support APL, BASIC, BLISS, C, COBOL, CORAL 66, DIBOL,™ DSM (Digital Standard MUMPS), FORTRAN, PASCAL, PL/I, RPG II, LISP, OPS5 and Digital's MACRO assembly language.

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accelerator for your numeric-intensive applications. And wherever floor space is a concern, the VAX-11/785 system gives you a special advantage because it fits in the same size cabinet as a VAX-11/780 processor.

VAXCLUSTER SYSTEMS: THE POSSIBILITIES ARE ENDLESS.

Even the top of the line isn't the end of the line of the VAX computer family, because you can link multiple processors together and manage them as a single unit in a VAXcluster system. This capability, which is unique in the industry, enhances data integrity, increases system availability, and does it all with complete user transparency. Moreover, it permits the resources of a single facility to be shared throughout your organization, and lets you keep pace with expanding needs through incremental system growth. As many as 16 processors and storage servers can be combined in a single VAXcluster system, delivering virtually unlimited computing capacity.

FLEXIBLE NETWORKING FOR TODAY AND TOMORROW.

The benefits of VAX system compatibility go far beyond expansion from one VAX processor to another, because the efficient communications options provided through Digital Network Architecture let you get the maximum benefit from all your installed systems – including non-Digital systems.

With DECnet™ network capabilities, multiple VAX processors and VAXcluster systems can exchange messages, transfer files, update database records, execute programs and share peripheral and processor resources in local and wide-area network configurations – transparently to both the user and the program. Adaptive routing helps ensure optimum reliability and transmission efficiency. This resource-sharing can incorporate all the VAX systems you own, and many others as well. Gateways let you use dial-up or dedicated lines, Ethernet high-speed local area networks, X.25, packet-switched data networks, PBX, 2780/3780, 3270 and SNA.

ENGINEERED FOR THE LONG TERM.

The chief advantage of the architectural compatibility we've engineered into every member of the VAX computer family is the return-on-investment it gives you. You can start anywhere and expand up or distribute down as your needs dictate. And you won't have to retrain, reprogram, restructure files or abandon the system you began with.

The VAX computer family's unmatched applications versatility means that every area of your operations – from the factory floor to the engineering lab to the executive office – can take advantage of the unequalled value of VAX systems. The VAX Software Source Book lists many of the thousands of applications developed and supported by Digital and independent vendors. And they're all available for installation now.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

Digital's VAX computers, like all Digital hardware and software products, are engineered to conform to an overall computing strategy. This means our systems are engineered to work together easily and expand economically. Only Digital can provide you with a single, integrated computing strategy direct from desktop to data center.

For more information on VAX computer systems – or if you would like to receive a complimentary copy of Digital's VAX Software Source Book and the VAX Family Brochure – contact your local Digital sales office. Or call 1-800-DIGITAL, ext. 200.



VAX-11/780 VAX-11/785

THE BEST ENGINEERED COMPUTERS IN THE WORLD.

digital™

SOFTWARE & SERVICES

Continued from page 60

AOS/VS operating system through standard serial ports.

A layered protocol corrects line errors, data compression increases throughput and no conversion programs are required to reformat text data, according to the vendor. Other features include single-user control, automatic transfers from dial-out to logoff and smart terminal mode.

The module is priced at $1,000.

Unique Automation Products, Suite G, 15401 Redhill Ave., Tustin, Calif. 92680.

H&A COMPUTER SYSTEMS, INC.
PXS Version 4

Multiple printer support and the capability to run on the IBM Personal Computer and Personal Computer XT have been added in Version 4 of H&A Computer Systems, Inc.'s application software for IBM Series/1 minicomputers using IBM's EDX operating system. Called PXS, the software is said to be an operating system that enhances EDX.

The system can now support commercial applications and development operations. The software also includes use of IBM Series/1 unmapped memory and IBM 3101 block-mode processing, the company said.

A perpetual license for PXS costs $1,500 per CPU.

H&A Computer Systems, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

ORION SOFTWARE, INC.
PC File Support Utility

Orion Software, Inc. has announced a new application of its Network Orion communications software for users of the IBM System/34, 36 and 38.

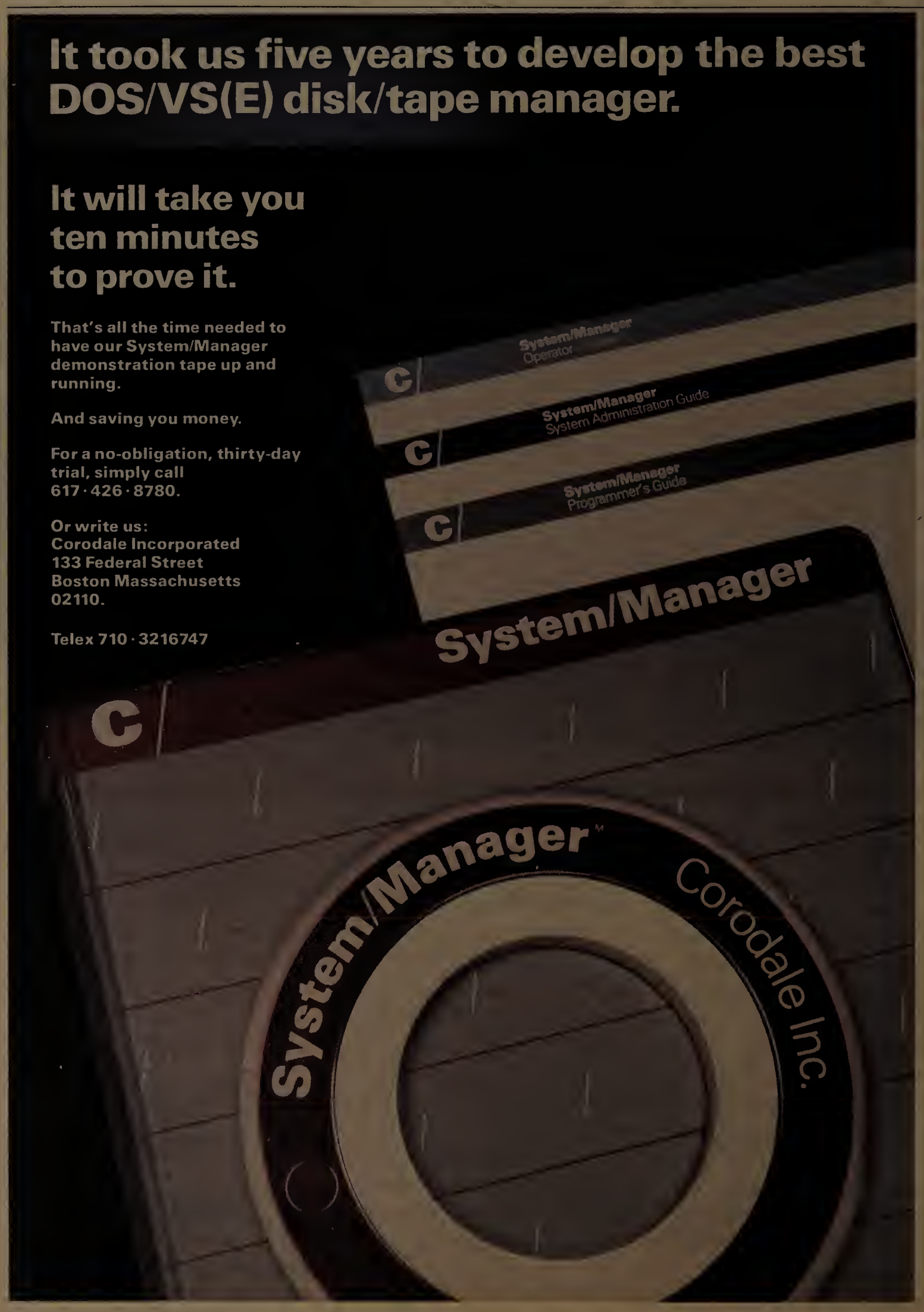
The application is said to allow IBM Personal Computer users to transfer virtual diskettes from one System/34, 36 or 38 to any other System/34, 36 or 38 using Network Orion.

Using the IBM PC File Support Utility (PCFSU), an IBM Personal Computer user can create a virtual diskette on the System/34, 36 or 38 or can access data on a virtual diskette that has been transferred from another System/34, 36 or 38, the vendor said.

The PCFSU transfers data to and from System/34, 36 or 38 format to Personal Computer format and handles the data transfer between the virtual diskette and the Personal Computer. As a file on the host System/34, 36 or 38, the data can then be transmitted by Network Orion to other systems for output or use on an attached Personal Computer, the vendor said.

The price of the modules required to transmit virtual diskettes is $3,200 for the System/34 or 36 and $4,800 for the System/38.

Orion Software, 222 Third St., Cambridge, Mass. 02142.



APPLICATION PACKAGES

COLLIER-JACKSON, INC.
CJ/Accounts Version 1.06

Collier-Jackson, Inc. has announced Release 1.06 of its CJ/Accounts Receivable software. The software is designed for use on Hewlett-Packard Co.'s HP 3000 series and Digital Equipment Corp.'s VAX-11 series of minicomputers.

Features have been added for viewing aged accounts and invoice information. Another enhancement included in the release lets the user locate specific invoices. The user may call up a list by customer name or number and page through and select the invoice desired, the vendor said.

A $14,000 license fee includes object and source codes, on-site training, installation, user documentation, an implementation plan and 90-day start-up support.

Collier-Jackson, 3707 W. Cherry St., Tampa, Fla. 33607.

INTEGRATED PLANNING, INC.
Stratagem for VAX-11

Integrated Planning, Inc., has announced that its Stratagem decision support system now runs on Digital Equipment Corp.'s VAX-11 line of minicomputers under DEC's VMS operating system.

Stratagem is an integrated planning environment for decision support applications, including strategic and financial planning and forecasting and market research analysis. It features financial modeling, statistics and econometrics, graphics, report writing and an application development language. The decision support system has been available on IBM mainframes using VM/CMS and MVS/TSO operating systems since 1981. According to the company, a VMS-compatible C compiler was used to run Stratagem on VAX-11 computers ranging from Microvax to VAX-11/785.

The VAX-11 version of Stratagem is priced from $30,000 to $60,000 for a perpetual license, depending on the system configuration.

Integrated Planning, 338 Newbury St., Boston, Mass. 02115.

VERTEX SYSTEMS, INC.
Payrolltax

Vertex Systems, Inc. has introduced a payroll tax service that can interface with a company's payroll system to calculate withholding taxes and contributions to federal and state unemployment and disability insurance programs.

Payrolltax is provided on magnetic tape or IBM-compatible 5¼-in. diskettes. It includes a load/print program containing five random-access files and a calculation program. Com-

Continued on page 66

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A Solution Center features Honeywell's GCOS8 software that ranges from personal productivity and decision support tools to business-specific solutions. So now your end users can build their own spreadsheets, forecast trends with color graphics, browse through online files, and create or revise reports.

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For more information on how a Solution Center can work for you, call toll free at 800-328-5111, extension 2724. In Minnesota, call collect 1-612-870-2142, extension 2724.

Another Big Idea From Honeywell Large Systems

Look to Honeywell Large Systems for solutions to information management problems and for products ranging from powerful computers to comprehensive networking capabilities.

Together, we can find the answers.

Honeywell

SOFTWARE & SERVICES

Continued from page 64

panies must provide their own interface to link with the payroll system.

The cost of a program containing information on all states, Washington, D.C., Puerto Rico and the Virgin Islands, plus all local tax support information, is $5,890 for the first year, with a renewal price of $2,560.

Subscribers can also request information for fewer states.

Charter subscribers receive a 33⅓% discount if they subscribe before the end of the year.

Vertex, 998 Old Eagle School Road, Wayne, Pa. 19087.

COMPUSYSTEMS, INC.
Online Collection System; Automated Indexing System

Compusystems, Inc. has announced an on-line collection system and an indexing system for use in IBM's CICS environment.

According to a spokesman, the Online Collection System (OCS) is an automated collection system designed for banks, collection agencies, retail outlets and medical institutions that use IBM's Vsam for all indexed files.

It provides automated account sequencing based on user-defined criteria, immediate access to account and transaction information, automatic generation of past-due letters, daily performance and delinquency statistics, a report generator, user-controlled operating parameters, a Help function and management and exception reporting. OCS can process multiple applications and organizations to service different departments within a company.

Compusystems' Automated Indexing System (AIS) was designed primarily for libraries, but can also be used by any organization that has indexing needs. It reportedly can be used for indexing newspaper articles, periodicals, books, census population schedules and government records and documents. AIS uses subject headings as the primary search argument to find articles, and an unlimited number of "see also" indexes may be attached under a single subject heading.

All maintenance of AIS is performed on-line, and, in addition to screen displays, the system provides microfiche output upon request. OCS is priced at $70,000, and AIS is priced at $12,000.

Compusystems, P.O. Box 2322, Suite 110, 1608 13th Ave. S., Birmingham, Ala. 35201.

APPLIED SOLUTIONS, INC.
Fixed Asset Management System

Applied Solutions, Inc. has announced the Fixed Asset Management System for users of IBM's System/34, 36 and 38 and Datamaster processors.

According to a spokesman, the system provides capabilities for internal and external accounting, tax reporting and planning.

It features a complete asset data base, a variety of reports and a tax reference guide.

The package allows utilization of up to three reporting modes — book, federal and state — for each asset and can accommodate each user's reporting requirements, according to the vendor.

The system automatically supports up to nine basic depreciation schedules per asset and highlights automatic conversion from accelerated to straight line depreciation. Reports include a fixed-asset ledger, which allows for management of depreciable and nondepreciable assets. The on-line tax reference guide is said to compare entries with tax laws and signal errors for greater accounting flexibility.

The Fixed Asset Management System is priced between $1,200 and $5,800, depending on the host system and the number of reports chosen.

Applied Solutions, Suite 300, 2368 Victory Pkwy., Cincinnati, Ohio 45206.

PACE APPLIED TECHNOLOGY, INC.
Komand/OBM

Pace Applied Technology, Inc. has announced the addition of an on-line budget management (OBM) module to its Komand DP Chargeback System integrated job accounting and chargeback system for IBM MVS and VS1 data centers.

According to a spokesman, Komand/OBM provides budget information for batch jobs and TSO sessions as costs are incurred. The module interfaces with Komand/Data Center Accounting System and Komand/Resource Billing System modules. Komand/OBM lets DP managers and users monitor account budgets and can warn users who are over budget or cancel their jobs to prevent further overruns.

The Komand/OBM module is priced at $5,000. The entire Komand system, with all modules and charging interfaces, is priced at $51,500.

Pace Applied Technology, 7900 Sudley Road, Manassas, Va. 22110.

PARALLAX SYSTEMS, INC.
Execucalc enhancements

Parallax Systems, Inc. has enhanced Execucalc, its

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ANNOUNCING
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When we introduce a new product, we don't have to spend time struggling to make it fit with the rest of our products. We just move quietly on to prepare the next product to meet your needs.

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CW910



SOFTWARE & SERVICES

Continued from page 66
mainframe electronic spreadsheet, to include many features of Lotus Development Corp.'s 1-2-3.

The enhancements offer upgraded formatting, consolidation, range commands and the capabilities of 1-2-3 formulas, Parallax said. Execucalc reportedly uses 1-2-3 commands for file importing and exporting.

Execucalc also now links to Parallax's Execuplot, a graphics system that can import data from 1-2-3 and Visicorp's Visi Calc, according to the vendor.

A perpetual license for Execucalc, which operates under IBM's VM/CMS environment, is available for $5,000.

Parallax Systems, 60 W. 9th St., New York, N.Y. 10011.

AUTOMATED INSURANCE RESOURCE SYSTEMS, INC.
AIR/Ratercalc Version 2.0

Automated Insurance Resource Systems, Inc. has announced Version 2.0 of its AIR/Ratercalc commercial lines rating system for the IBM Personal Computer and compatibles.

According to a spokesman, AIR/Ratercalc is designed to automate policy premium quotations for the insurance industry. Enhancements in Version 2.0 include quotes that can be saved on disk for faster retrieval and rerating and a password system that will allow a user to define which features of the package can be used by others. The enhanced version also provides a producer data base and a production log to monitor business activity and usage of AIR/Ratercalc.

In addition, the package's Airlink option is an IBM CICS mainframe interface system allowing the transfer of files from microcomputers to an insurance carrier's IBM mainframe computer.

Version 2.0 of AIR/Ratercalc is priced according to the number of individual state insurance regulation versions required. The first state version is leased for $650/mo, and subsequent states are priced according to a discount schedule.

Automated Insurance Resource Systems, Suite 201, 1250 E. Diehl Road, Naperville, Ill. 60540.

DATA PROCESSING DESIGN, INC.
Word-11 Version 3.0

Data Processing Design, Inc. has announced a version of its Word-11 word processing software to run on Digital Equipment Corp.'s PDP-11 under DEC's RSX-11M and RSX-11M+ operating systems.

Recent upgrades include list processing; built-in dictionaries for spelling error detection; automated table of contents and footnoting; grammatical editing keys; bolding and underlining; global search and replace; and column operations that move, insert, delete or add while still in the editing mode, according to the vendor.

Version 3.0 enhancements also include a system management utility; scientific character set support for DEC's VT100 terminal and Professional 350 micro and Diablo Systems, Inc.'s Diablo 630 printer; journaling; military-style paragraph numbering; support for the Xerox Corp. 2700 laser printer; and file conversion tools to convert data files and documents prepared with DEC's Runoff text formatter to Word-11.

Prices for the RSX-11M and RSX-11M+ systems range from $3,500 to $8,500.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

GMD SYSTEMS INTERNATIONAL, INC.
Customer Ordering Servicing

GMD Systems International, Inc. has announced GMD Customer Ordering Servicing (COS), an on-line order-entry system for use with IBM's Manufacturing, Accounting & Production Information Control System (Mapics) on IBM's System/34, 36 and 38.

According to a spokesman, COS works in conjunction with Mapics' Order Entry and Invoicing system. COS allows a user to enter an order on-line; at the end of a user session, the order is posted to a master file, and inventory picking lists are generated. After order shipment, the system adjusts inventory levels and generates invoices.

COS also allows the user to enter batch-lot and serial number assignments and catch weight at the time of order entry.

Allocation of inventory can be done at the time of order entry or order picking, and the system can accommodate blanket orders, drop shipment orders and bill-to and pay-from addresses, as well as sold-to and ship-to addresses.

The System/34 version of COS is currently available for $7,200. The System/36 and 38 versions are scheduled for shipment by year's end and will be priced at $8,100 and $10,800, respectively.

GMD Systems International, Suite 420, 8601 Dunwoody Place, Atlanta, Ga. 30338.

PROJECT RESOURCES, INC.
OCS3000 enhancements

Project Resources, Inc. has announced three system enhancements for its Operation Control System that automates operation of a Hewlett-Packard Co. HP 3000 data processing installation.

Recently added to the OCS3000 were a string and date parameter substitution that allows information to be calculated into the job stream, a workday scheduling feature that can create a production schedule that automatically adjusts for installation-defined holidays and weekends and a tape management feature that allows for automatic tape selection and automatic updating of tape history.

The cost of the base product module is $1,500.

When the experts choose a private network, they're not impressed by all the squawking.



SOFTWARE & SERVICES

Project Resources, Suite 201, 560 San Antonio Road, Palo Alto, Calif. 94306.

ISSCO GRAPHICS
Support for IBM 3270-PC/G, 3270-PC/GX

Issco Graphics has announced that all of its graphics software products now support the IBM 3270-PC/G as well as the 3270-PC/GX graphics workstations.

The recently introduced IBM workstations are designed for use by business and technical professionals whose requirements extend beyond the graphics capabilities of the IBM 3279 graphics terminal, according to a spokesman.

Issco Graphics, 10505 Sorrento Valley Road, San Diego, Calif. 92121.

GEOGRAPHIC SYSTEMS, INC.
Geofiles

Geographic Systems, Inc. has announced updates for its Geomarketing software. Geofiles runs on IBM 4300 series and larger computers under IBM's MVS/TSO and VM/CMS operating systems. The software also runs on Digital Equipment Corp.'s VAX-11/700 series under DEC's VMS. Issco Graphics' Tell-A-Graf software is also needed.

The updated Geofiles provides coordinates for boundaries defined by the Arbitron Ratings Co., the A. C. Nielson Co., the Federal Bureau of Economic Analysis and the Federal Office of Management and Budget's Metropolitan Statistics Areas. Licenses cost from $1,000 to $2,000.

Geographic Systems, 204 Andover St., Andover, Mass. 01810.

GENRAD, INC.
Hilo-2 for HP 9000 Series 500

Genrad, Inc. has announced that its Hilo-2 logic simulation software system is available for Hewlett-Packard Co.'s 9000 Series 500 computers.

Hilo-2 aids in the engineering design verification and testing of digital electronics in semicustom integrated circuits such as gate or cell arrays, custom integrated circuits and very large-scale integration devices.

Hilo-2 applications include verification of digital logic designs, race, hazard spike and worst-case analysis; interactive design analysis over a variety of technologies; hierarchical simulation for managing design complexity at higher conceptual levels; and test validation through fast fault simulation at gate and functional levels, according to the vendor.

Price of the Hilo-2 for the HP 9000 Series 500 is $50,000.

Genrad, 2855 Bowers Ave., Santa Clara, Calif. 95051.

SATURN SYSTEMS, INC.
Saturn-Calc native mode for VAX-11

Saturn Systems, Inc. has announced a conversion of its Saturn-Calc spreadsheet to native mode for Digital Equipment Corp. VAX-ll computers under DEC's VMS operating system. The program has been available on the VAX-11 by running under DEC's VMS PDP-11 emulation mode, the vendor said.

The Saturn-Calc native mode package will be available by November 1984.

The price of Saturn-Calc in native mode for the DEC VAX-11 is $1,956.

Saturn Systems, #218, 6875 Washington Ave. S., Minneapolis, Minn. 55435.

FLORIDA COMPUTER, INC.
COM/CAR option

Florida Computer, Inc. (FCI) has announced a computer output microfilm, computer-assisted retrieval (COM/CAR) office automation product for Wang Laboratories, Inc. computers running under Wang's VS operating system.

The COM/CAR option will automatically extract and generate document indexes from a data file or magnetic tape, according to the vendor. The COM recorder device then produces the microfilm roll or microfiche to be made available for automated retrieval of the documents with search commands from FCI's Micrographics Management software.

Average price of the COM/CAR interface is $20,000.

Florida Computer, 99 N.W. 183rd St., North Miami, Fla. 33169.

DATA BASE MANAGEMENT SYSTEMS

PANSOPHIC SYSTEMS, INC.
Easytrieve Plus — IDMS interface

Pansophic Systems, Inc. has introduced an interface between its Easytrieve Plus package and Cullinet Software, Inc.'s IDMS data base and Integrated Data Dictionary (IDD).

The IDMS interface provides complete facilities for information retrieval and maintenance of the IDMS data bases, the vendor said.

With Easytrieve Plus, the data base can be accessed either by automatic path processing or by controlled processing using statements similar to those used in Cobol, the vendor said.

The IDD interface is said to generate file, record and define statements

Continued on page 70

MCI, MasterCard, Wang and Michigan Bell chose BBN Communications. Today, everybody is sounding off about their networking capabilities. But the people who really know networks want solutions, not talk. Which is why so many of them come to BBN Communications.

Companies like MCI Mail, who asked us to build a national network for its new electronic delivery service. MasterCard International, who selected us to install their domestic credit authorization network. Wang Laboratories, who chose us to link its nationwide system of offices. And Michigan Bell, who came to us for a data communications network.



The Experts' Expert. The experts come to us because we have more experience building wide-area data networks than anybody else. In fact, we built our first one back in 1968. And we pioneered packet switching, a technology that now forms the foundation of the industry.

MCI Mail

But what's really important is that our experience has taught us how to build networks that are reliable, economical, secure and easy to manage. Which is exactly what companies concerned with communications are looking for.

For example, to guarantee reliability, we use state-of-the-art packet switching technology. Technology proven reliable in industry and government agencies around the world.

To ensure security, we build in special systems that limit network access to those who should have it.

WANG

And to make our networks easy to manage, we provide an operations center which lets you monitor and control the entire system from a single location.

MasterCard International Inc.

What's more, our networks are computer manufacturer independent. You can connect all your data processing equipment, whether made by IBM, Digital Equipment, Wang, Data General or any other manufacturer.

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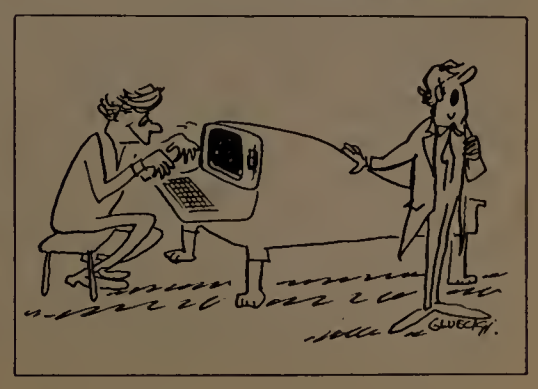
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BBN Communications Corporation

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SOFTWARE & SERVICES

Continued from page 69
from the IDD for input to Easytrieve Plus or operating system utilities.

The IDMS and IDD interfaces are compatible with IBM's OS or DOS operating systems using IDMS Release 5.7 and IDD Release 2.0 or above.

The IDMS interface for Easytrieve Plus is priced at $7,000 for a DOS version and $8,500 for an OS version. The IDD interface option is priced at $5,000 for DOS and $6,500 for an OS version. Easytrieve Plus is priced at $21,000 for DOS and $27,000 for OS.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

SIS SUNDATA
PC Plus II

SIS Sundata, formerly Sun Information Services Co., has announced PC Plus II, which reportedly bundles microcomputer-to-mainframe data transfer software with SIS' Suninfo mainframe relational data base management system.

According to a spokesman, the integrated software gives IBM Personal Computer users a direct window into IBM mainframe files through IBM's Vsam data access method. It allows users to upload or download any portion of their data bases using nonprocedural commands from the Personal Computer.

The spokesman said users can access up to 10 separate data bases on the mainframe and report from them as though they were one data base. Request formulation and data entry and manipulation can be done locally on the micro without on-line connection to the mainframe.

PC Plus II includes a security system that limits access to the host computer, an IBM Systems Network Architecture/Synchronous Data Link Control transmission protocol up to 4,800 bit/sec. and a nonprogramming language dubbed NPL.

PC Plus II is priced at $25,000, which includes a license for use of Suninfo and PC Plus II software for three Personal Computers.

SIS Sundata, Glenhardie Corporate Center, 1285 Drummers Lane, Wayne, Pa. 19087.

EASYSPEC, INC.
Easyspec

Easyspec, Inc. has introduced a data base design package for applications developers said to automate the definition of users' requirements and to design the relational data base structure in 3rd Normal Form.

Easyspec is a menu-driven package designed for users of Digital Equipment Corp. VAX-11 superminis. It is compatible with data base programs like Oracle Corp.'s Oracle, Relational Technology, Inc.'s Ingres, Digital Equipment Corp.'s Datatrieve and IBM's SQL.

The program is said to create and maintain the requirements data base, generate requirements reports and analyze data base elements requirements for completeness and correctness. It also is said to interface with the user's relational data base system, maintain the table structures and generate graph and table structure reports.

Prices range from $2,000 to $8,000, depending on the VAX-11 model and license type.

Easyspec, Suite 202, 17629 El Camino Real, Houston, Texas 77058.

FOUR-PHASE SYSTEMS, INC.
Quest/IV

Four-Phase Systems, Inc. has announced the Quest/IV query system software package for its 4000 and 5000 series of office information systems.

According to a spokesman, Quest/IV allows access to information for record selection, retrieval and output of data in a variety of user-defined formats. It is said to provide ad hoc file inquiry, report generation, list creation and processing capabilities. The software also allows several terminals to query the data base simultaneously.

The spokesman said Quest/IV can be used to query index sets and archived Foreword documents. Foreword is the company's shared logic word processing system. Information obtained through Quest/IV can be printed in a user-defined report format, displayed on the screen or transferred to Foreword archive files.

The permanent license fee for Quest/IV is $1,500.

Four-Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

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ELXSI, 2334 Lundy Place, San Jose, California 95131
408/942-1111, Telex 172320.

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VAX is a trademark of Digital Equipment Corporation. EMBOS and ENIX are trademarks of ELXSI.

SOFTWARE & SERVICES

DATABASE UTILITY GROUP
Insight

Database Utility Group (Dbug) has announced Insight, an interactive, real-time data base monitor that reportedly will allow a data base administrator to monitor Software AG of North America, Inc.'s Adabas performance problems.

According to a spokesman, Insight will allow the data base administrator to obtain real-time windows on the Adabas nucleus running in multiuser mode. The administrator can obtain immediate displays on the current state of the nucleus, summarized activity over short intervals and activity over the entire session.

The spokesman said the displays will allow the administrator to discover and respond to Adabas performance problems as they occur, including hold-queue overflows, poorly performing applications, periodic buffer-pool shortages, periods of poor response and excess runtimes.

Dbug Insight works with the company's Dbug Adabas Performance Analysis System (Apas) to provide real-time task monitoring capabilities and the ability to generate batch reports and output files. It can also be used with Dbug's Adabas Protection Log Extract Utility (Pleu), which provides audit trail and selective data recovery functions.

Dbug Insight, Apas and Pleu are available as a package priced at $15,000.

Dbug, P.O. Box 4912, Federal Way, Wash. 98063.

CONSUMER SYSTEMS CORP.
Databasic price increase

Consumer Systems Corp. has announced price increases for its IBM OS and DOS operating system versions of Databasic, a utility for IBM's DL/1 data base management system.

Databasic reportedly allows a user to create miniature product data bases, correct content errors and audit data structures.

The product reportedly interfaces with any host language and allows the user to restructure a data base. With Databasic, users can also create new data bases from existing files.

The OS version price of Databasic will rise from $24,000 to $28,000, and the cost of a DOS version will increase from $15,000 to $17,500, the vendor said.

Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

INFODATA SYSTEMS, INC.
Inquire training

Infodata Systems, Inc. has announced computer-based training for users of its Inquire data base management system.

All of the Inquire computer-based training courses will be developed with Goal Systems International, Inc.'s Phoenix presentation system for IBM and plug-compatible systems, Infodata said.

Annual license for the program costs $5,800, including the course, Phoenix presentation system, field service and three manuals — the Inquire primer tutorial, a student manual and a teacher's guide.

Permanent license is $8,500 with a second-year $235/mo charge for field service and the presentation system, the vendor said.

Infodata Systems, 5 Tobey Village Office Park, Pittsford, N.Y. 14534.

INACOM INTERNATIONAL
Mini-Index

Inacom International has announced a conversion of its Micro-Index program for use with Inacom's Tech-Doc data base on Digital Equipment Corp.'s VAX-11 series of computers using the DEC VMS operating system. Known as Mini-Index, the initial conversion uses the C language.

Installation of the system will be done on-site by an Inacom technician. Subscribers will receive new updated index tapes every 60 days to keep current with the data base, a spokesman said.

Subscription cost for Mini-Index is $2,850 per year, plus a one-time installation fee of $2,000.

Inacom International, 4380 S. Syracuse St., Denver, Colo. 80237.

LANGUAGES

INFORMATION PROCESSING TECHNIQUES CORP.
DG'C' Revision 2.24

Information Processing Techniques Corp. (IPT) has announced an enhanced release of its C compiler for Data General Corp. processors.

According to a spokesman, Revision 2.24 of IPT's DG'C' C compiler is designed to operate under the entire line of DG computers. It is said to be a full implementation of the C language and is consistent with both the Kernighan and Ritchie standards of that language.

The compiler will run under any mapped DG operating system and will generate code for any DG computer or operating system, the spokesman said. Revision 2.24 of DG'C' is priced between $3,500 and $9,000.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

CATALYTIX CORP.
Safe C Compiler; Safe C Dynamic Profiler

Catalytix Corp. has announced a checkout compiler for the C programming language and a C profiler. The Safe C Compiler and the Safe C Dynamic Profiler are available for the IBM Personal Computer and compatibles and a variety of other computers running under IBM's PC-DOS, Unix, Microsoft Corp.'s Xenix and MS-DOS and Digital Equipment Corp.'s VMS operating systems.

The Safe C Compiler provides run-

Continued on page 73



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2. MICROCOMPUTER GRAPHICS.
Roy E. Myers. Provides the essential mathematics and programming techniques you will need for computer graphics applications in BASIC, and many other topics. **Publisher's Price: $12.95.**

3. THE COMPLETE HANDBOOK OF PERSONAL COMPUTER COMMUNICATIONS: Everything You Need to Go Online with the World.
Alfred Glossbrenner. This digested collection of detailed information on the far-flung aspects of networking and data bases shows you how to gain access to a universe of information with your small computer. **Publisher's Price: $14.95.**

4. WRITING IN THE COMPUTER AGE: Word Processing Skills and Style for Every Writer.
Andrew Fluegelman and Jeremy Joan Hewes. A manual for everything from types of equipment to the fine points of formatting the finished work. **Publisher's Price: $10.95.**

5. CP/M AND THE PERSONAL COMPUTER.
Thomas A. Dwyer and Margot Critchfield. A crisp, detailed tutorial that will easily turn the average reader into a skilled CP/M user. Features lab exercises in each chapter. **Publisher's Price: $19.95.**

6. EXECUTIVE COMPUTING.
John M. Nevison. 25 business methods illustrated by computer programs, in a step-by-step casebook. You'll find details on pricing techniques . . . long-range planning . . . corporate data bases . . . and much more. **Publisher's Price: $12.95.**

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Computerworld 9/10/84

Bolstering the defenses of the kingdoms of LAN.

Each personal computer in a Local Area Network is a kingdom unto itself. Messengers from different kingdoms must pass through each other's kingdom to get information. It's the law of the LAN that they be permitted to do so. Confidential documents, therefore, are highly accessible to all. Which is why no realm is truly secure.

The corporate jewels need defending.

Information is your greatest corporate resource. And the fact of the matter is, most executives are in dire need of an extra layer of data protection. Costly mistakes due to accidental access errors and omissions by other executives—can be catastrophic.

After all, executives are only human. Even Chief ones. And there's always the possibility of disgruntled employees maliciously modifying, copying or destroying important data.

Conventional defenses are vulnerable.

Password schemes, for example, tend to be too easy for devout hackers to tear asunder. And if elite passwords are discovered, dedicated file servers are of little help.

Automatic time stamps are a solution to password vulnerability. However, they can be confusing for users. And while hardware port protection devices add extra security—they also add additional salary overhead costs.

Defining the best possible defense.

You'll never achieve total invulnerability. If you could, you'd have utter anarchy. Because no one could access your node on the LAN. Which is why your best defense is to implement a security program that'll ensure the most efficient use of your resources—with a minimum of surprises.

While also being a cost-effective deterrent.

That's why hardware alone isn't the solution. It's just too easy to copy. While software alone is simply too easy to break. And since neither one alone can give you the protection you need, your solution lies in the interlocking of both.

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Simply put, Codercard is a tamper-proof device, slightly thicker than a credit card, that contains a self-powered microprocessor. Encoded on this is a unique ID number. And a new, complex series of algorithms that are key to the authentication process.

Application is simple. The user merely inserts the card into a base unit that connects to the master controller. The master controller then runs a software check for ID validity. If the card is valid, the controller starts the algorithm software process. Both card and master controller must arrive at the same answer.

Each time the card is used, the master controller quasi-randomly generates a different set of algorithmic parameters for each security check.

By using multiple parameters, Codercard gives you over 400 billion non-linear numerical combinations for authorization and authentication processing. Which means 400,000,000,000 ways to secure your data.

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SOFTWARE & SERVICES

Continued from page 71

time checking of C programs and produces a dynamic trace of function calls with their arguments and returned values, according to the vendor. It does not impose any restrictions on the use of C and accepts the same code as an ordinary C compiler.

Prices range from $400 for an MS-DOS version to $4,000 for the DEC VAX-11/780 version.

Safe C Profiler is invoked as an option to the Safe C compiler but can be used without the compiler, a spokesman said.

Safe C Dynamic Profiler counts the number of times each function in a program is called. The Profiler also reports the execution count for each statement during a run of the program. According to the vendor, it can indicate the number of times a particular loop is executed or how many times each branch of a conditional is taken and can find parts of a program that have not been executed.

Prices range from $200 for MS-DOS to $1,500 for a VAX-11/780 version.

Catalytix, 55 Wheeler St., Cambridge, Mass. 02138.

DIGITAL EQUIPMENT CORP.
F77/RT-11

Digital Equipment Corp. has announced the implementation of PDP-11 Fortran 77 for use with its Professional 350 personal computer and PDP-11 computers.

Running under DEC RT-11 operating systems, the F77/RT-11 is the same Fortran 77 compiler running under DEC's RSX and RSTS operating systems, according to a company spokesman.

According to the company, the product is targeted for RT-11 users and is suited for scientific and university environments.

Applications include development and execution of analytical programs. F77/RT-11 is said to be compatible with DEC's VAX-11 Fortran, according to the company.

The product's new compiler runs under Version 5 or 5.1 of RT-11 on any PDP-11 or Professional 300 configuration that has at least 48K bytes of user memory, 1M byte of available disk space and a floating-point processor.

Prices for the product begin at $950.

DEC, 146 Main St., Maynard, Mass. 01754.

MITCHELL ASSOCIATES
Lisp/Prolog

Mitchell Associates has announced a joint implementation of the Lisp and Prolog artificial intelligence languages for all Prime Computer, Inc. processors that supports V-mode instruction, including the 50 series computers.

Lisp/Prolog combines interpretive and compiled modes for both languages in a single package.

Each language may be compiled or interpreted as required, and each language may make calls on the other without returning to operating system mode.

High-level Lisp and Prolog can also be mixed with more conventional languages via a mechanism for loading relocatable binary object files.

Extra predicates and functions have been added to facilitate file manipulation and I/O, to perform error trapping and activate system utilities, such as spooling.

The system is written in Fortran 77 using the Salford University FTN77 compiler, which is said to have features that facilitate its own bootstrapping.

The perpetual license price of Lisp/Prolog is $5,000 for commercial use and $3,500 for educational institutions. A maintenance contract is available for $750/year.

Mitchell Associates, P.O. Box 6189, San Rafael, Calif. 94903.

BOOLE & BABBAGE, INC.
XPF/Cobol Release 1.1.0

Boole & Babbage, Inc. has announced a version of its XPF/Cobol, an interactive testing and debugging tool. Release 1.1.0 runs on IBM mainframes using IBM's MVS operating system and works with the IBM Cobol compiler, Version 4.

XPF/Cobol Release 1.1.0 features increased speed in execution, reduced storage requirements, new control commands and compatibility with IBM's new Cobol compiler.

A Session Log facility records activities of the debugging session for review by the user.

XPF/Cobol is available for a perpetual license fee of $30,000 for the first CPU.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

PRODUCTION SYSTEMS TECHNOLOGIES, INC.
OPS83

Production Systems Technologies, Inc. has announced the OPS83 compiler-based programming language for users of Digital Equipment Corp.'s VAX-11/750 and VAX-11/780 processors.

According to a spokesman, OPS83 was designed to serve as a tool for use in developing knowledge-based expert systems. The language is said to integrate forward-chaining rule-based paradigms and the procedural programming paradigms characteristic of Pascal, C and Ada.

OPS83 programs reportedly execute at higher speed with fewer rule firings needed. The ability to call functions and subroutines from rules permits OPS83 programs to be more modular and easier to maintain.

Introductory license fees are $10,000 for the first CPU and $6,500 for each additional CPU.

Production Systems Technologies, 642 Gettysburg St., Pittsburgh, Pa. 15206.

See **LANGS** page 80

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We can't do anything about your taxes. Or the rush-hour traffic. Or the person who keeps stealing lunches out of the office refrigerator.

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There's no way one could be. Because only 3M controls every aspect of the manufacturing process.

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We also test our floppies. At least 327 ways. And not just on exotic lab equipment with perfectly aligned, spotless heads. But also on office equipment like yours.

We even reject a floppy if its label is crooked.

Some people think we're a little crazy to go to all that trouble. After all, do you really need a diskette that can make one read/write

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3M diskettes

pass on every track, every hour, every day for the next 200 years?

Not really.

But now that you know a 3M floppy can do it, you can relax.

And worry about other things.

Like who stole your lunch from the office refrigerator.

One less thing to worry about.

TOOLS from page 55

proving productivity would be at the technique level.

The problem seemed to be in the long lag times from transferring system specifications from analysts to programmers.

The suspect technique was identified as traditional flow charting and block diagramming. Every flow chart and block diagram was unique in structure, depending upon the analyst's or programmer's logical view of the system. It was also difficult to maintain diagrams that directly related to the final structure of the software. As a result, we decided to find a replacement technique for documenting system and program logic.

For several years, some of the Highway Patrol's top system designers had been following the work of Kenneth Orr in developing the Warnier-Orr methodology of structured design. This methodology is now referred to as Data Structured Systems Development (DSSD). Through the use of DSSD designs, the opportunity for increasing productivity not only in design specifications but in actual programming code seemed promising.

We decided to train all staff in DSSD design techniques and to implement fully the methodology for all software development. While other productivity enhancements were installed during the 1980-1983 period, DSSD was the major change in development technique.

The next major change occurred in March 1983, when the installation of Cincom Systems, Inc.'s Mantis fourth-generation programming language was completed and Cobol was discontinued for on-line programming. To determine if these two major tools (DSSD and Mantis) had actually increased productivity, several systems were tracked for work load statistics.

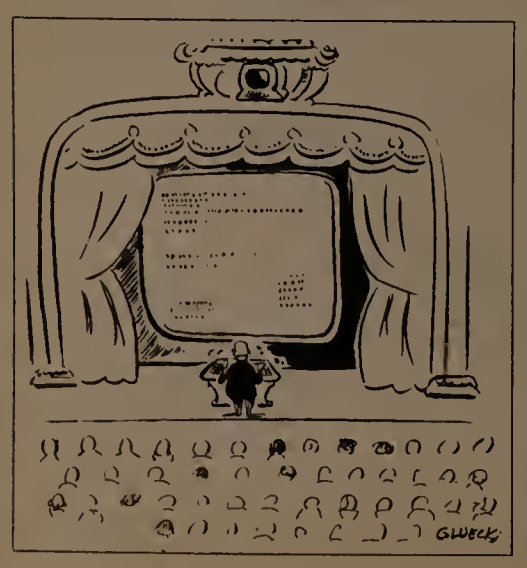
These systems projects covered two periods of change:

- Period I: Began using DSSD methodology (1980-1983).
- Period II: Installed Mantis for all on-line programming (1983-1984).

Using the data in Table I, the average lines of code per project hour were computed (Table II).

This data shows some conflicting results. It appears that lines of code per project hour decreased from Period I to Period II — a decrease in productivity. This was difficult to accept since the opposite seemed to be taking place on each new system. It became apparent that the complexity of each system was not included in the analysis of productivity, but should have been.

In rethinking the system development cycle, it was important to determine when complexity was cast in design and thus identifiable. In other words, when can lead analysts and software designers turn over a system to the general programming staff?



The suspect technique was identified as traditional flow charting and block diagramming. Every flow chart and block diagram was unique in structure, depending upon the analyst's or programmer's logical view of the system. It was also difficult to maintain diagrams that directly related to the final structure of the software. As a result, we decided to find a replacement technique for documenting system and program logic.

At the Highway Patrol computer facility, all technical design is completed when the analysts have documented system functions and processes and the data base files, screens, batch reports and file views have been defined and cataloged. At this point, junior programmers can complete the project with little chance of design error.

Table III was then developed to determine how many of these design outputs or system functions were incorporated in each of the 10 systems studied, and analyst hours were separated from programmer hours to focus more accurately on the productivity of the programming staff.

The number of functions in each system was derived from the total screens, data base files, batch reports and file views identified for each system. Two other measures of productivity were then developed and listed in Table III — lines of code per programmer hour and programming hours per function. Lines of code per programmer hour still shows a decline in productivity from Period I to

See **TOOLS** page 77



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System Development Metrics

System	Programs		Batch Reports	File Views	Screens	Files	Project Hours		LOC	
	On-Line	Batch					Analyst	Programmer	On-Line	Batch
A	—	11	6	—	—	1	692	1,216	—	7,031
B	29	12	7	—	4	5	989	1,026	6,657	6,161
C	71	82	45	—	14	17	2,695	4,071	24,922	43,007
D	36	34	8	—	7	7	1,232	1,077	7,711	12,322
E	87	29	14	—	13	11	2,123	4,116	30,049	15,487
F	14	10	5	6	5	5	200	845	2,687	4,371
G	7	2	6	12	11	4	141	215	2,240	614
H	43	10	24	31	18	17	2,653	2,613	20,046	7,691
I	22	11	19	44	18	17	4,080	1,568	12,406	6,252
J	40	34	20	67	28	12	3,619	4,107	16,183	20,970

Table I.

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the end of Period II, even though two major productivity tools — DSSD and Mantis — were being used.

However, when viewing productivity based on programming hours per function (with the exception of System E), it now appears that programmer productivity has been improving and continues to improve.

System E may be an anomaly, or its low productivity may be due to the large number of on-line programs in the system that were not adequately reflected in the complexity of the system as measured by functions.

If functions are an accurate measure of complexity, System J was almost two times more complex than its pre-DSSD/Mantis counterpart, System C. Yet productivity decreased less than 50% in terms of lines of code per programmer hour, and the number of programming hours required to develop a function decreased 40%. Thus, it is evident that system complexity must be a prime determinant when attempting to measure productivity.

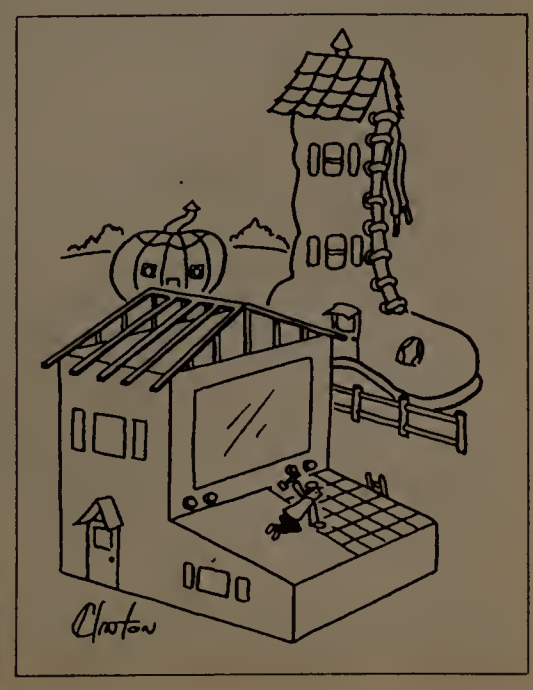
However, when viewing productivity based on programming hours per function . . . it now appears that programmer productivity has been improving and continues to improve.

Another example: System I from Table II shows the lowest productivity when using lines of code produced per total project hours (3½). By removing analyst hours from the computation (see Table III), programmer productivity on System I is consistent with other Period II systems when using lines of code ratios.

It is not possible to compare System I with System C in terms of programmers because System C required a low number of analysis hours. However, a comparison of System G with System E shows a 92.3% reduction in analyst-hours required to design a system function for two systems of comparable complexity.

Our studies lead us to the follow-

See **TOOLS** page 78



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SOFTWARE & SERVICES

Productivity rates for programmers

Period	System	LOC per Project Hour	Techniques DSSD	Techniques Mantis
I	A	3.69	No	No
	B	6.36	No	No
	C	10.04	No	No
	D	8.68	No	No
	E	7.30	Yes	No
	F	6.75	Yes	No
II	G	8.02	Yes	Yes
	H	5.27	Yes	Yes
	I	3.30	Yes	Yes
	J	4.81	Yes	Yes

Table II.

Programmer productivity based on complexity of systems

Period	System	Functions	LOC per Programmer Hour	P-Hours per Function
I	A	7	5.78	173.7
	B	16	12.49	64.1
	C	76	16.69	53.6
	D	22	18.60	50.0
	E	38	11.06	108.3
	F	21	8.35	40.2
II	G	33	13.27	6.5
	H	90	10.62	29.0
	I	98	11.90	16.0
	J	127	9.05	32.3

Table III.

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ing conclusions:

■ Lines of code per programmer, as a measure of productivity, is misleading and must be replaced by a technique that accounts for system complexity and the efficiency of fourth-generation design and software tools.

■ To use functional complexity as a replacement factor for lines of code in measuring productivity requires answers to the following questions: What factors constitute complexity? How should these factors be combined to develop complexity scores? How would these scores be validated, given the few data collection points and the changing programming environment?

The fourth-generation tools installed at the Highway Patrol have almost completely eliminated the programming backlog. The synergistic effect of all the productivity enhancements has led to a stable and increasingly efficient systems development process.

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ines all statements and inputs to ensure that they utilize the correct syntax.

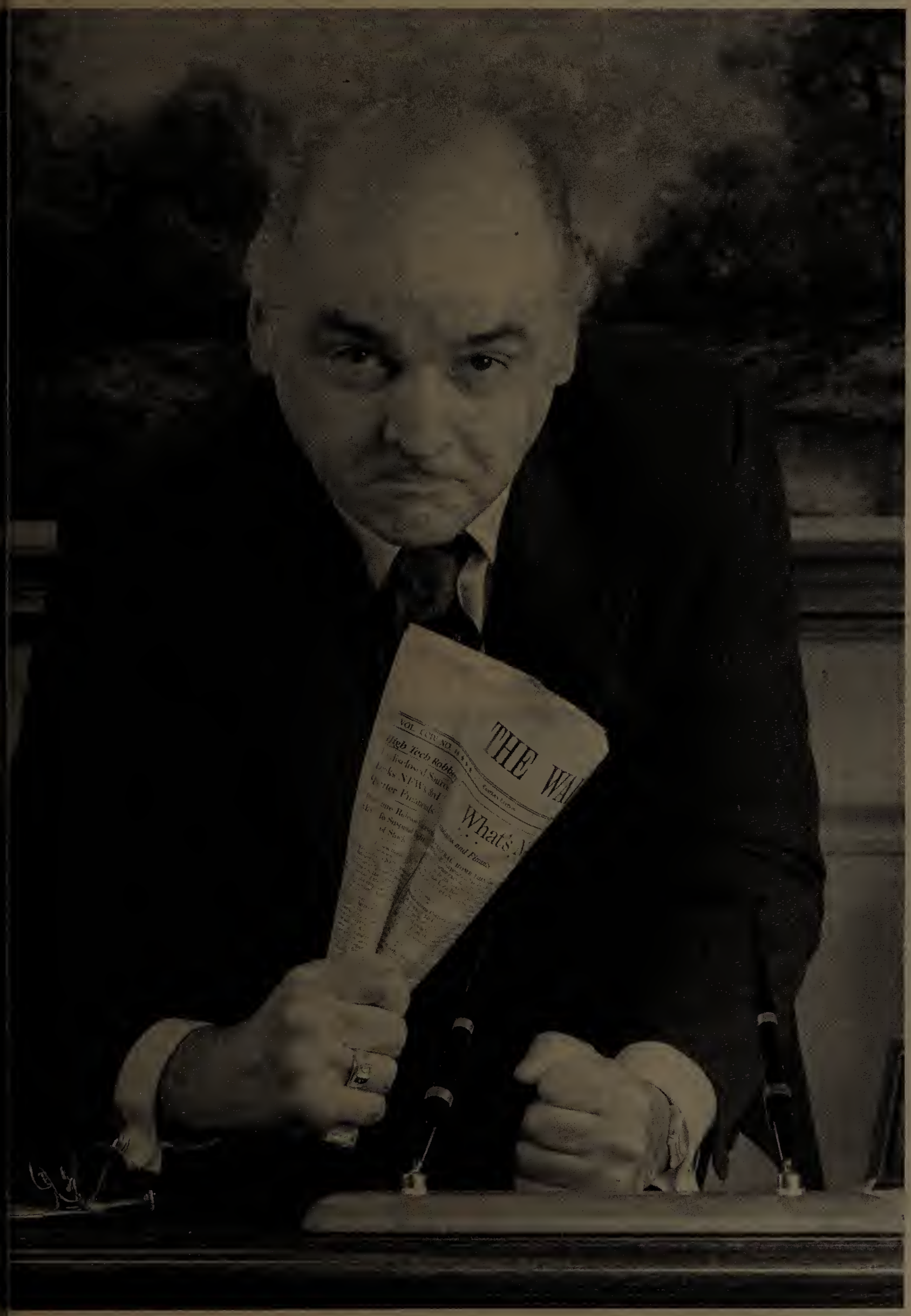
The Reveal programming language is capable of both procedural or conventional algorithmic operations and linguistic representation of imprecise data and approximate inquiries, the spokesman claimed. Reveal allows multiple knowledge bases, created by different sources, to be switched and compared within the DSS. The knowledge base is maintained as a set of rules written in the Reveal policy language and the "control strategy or inference engine" is written in the Reveal procedural language, which invokes or applies rules and sets of rules as needed.

Reveal is priced at $50,000 for the IBM mainframe environment and $25,000 for the ICL and DEC environments. If a customer maintains a mainframe license for Reveal, Personal Computer XT copies are priced at $2,000 each. In the absence of a mainframe copy, the Personal Computer XT version of Reveal is priced at $40,000 for 10 copies. Reveal is also available through the Tymnet, Inc. Tymshare network.

More information is available from Infotym, 20705 Valley Green Drive, Cupertino, Calif. 95014



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VM SOFTWARE INC.

SOFTWARE & SERVICES

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VERDIX CORP.
Verdix Ada Development System

Verdix Corp. has introduced the Verdix Ada Development System (Vads) designed for large-scale embedded systems.

The initial version of the Vads compiler is compatible with the Digital Equipment Corp. VAX-11 series under DEC's VMS operating system.

Vads is currently undergoing testing by the Department of Defense for certification as an Ada-programmable system, a spokesman said.

The front-end compiler carries a $10,000 price tag.

Verdix, Westgate Research Park, 7655 Old Springhouse Road, McLean, Va. 22102.

REMOTE COMPUTING SERVICES

DATABANK, INC.
BTI-8000 Computer Service

Databank, Inc. has announced an on-line, time-sharing service featuring the BTI Computer Systems, Inc. BTI-8000 superminicomputer.

The BTI-8000 Computer Service can reportedly accommodate up to 200 simultaneous users. Besides time-sharing, Databank will provide accounting packages, statistical analysis, leased lines and electronic mail.

Pricing for the BTI-8000 Computer Service is based on usage, the spokesman said, and begins at $15/connect hour.

Databank, 6080 McDonough Drive, Norcross, Ga. 30093.

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gram the demonstration Radio Shack TRS-80. A computer-using generation? Undoubtedly. Computer-controlling? Sorry, but the answer is no.

Staying abreast of technology is grueling work. Old systems never die, just the hopes of those who maintain them. New languages and so-called productivity aids arise with metronomic regularity. The result is that programmers and analysts in the typical shop must be competent in five to eight radically different languages.

What is worse is that there is no end to it. Typically, DPers must essentially memorize the equivalent of 500 pages of soporific technical manuals every month, year after year. Understandably, this wears thin after a while.

Why seek management as a long-term goal? "That's where the money is," some will answer again. They are wrong, at least in some cases. Because of the laws of supply and demand, technical specialists such as system programmers or data base administrators command higher salaries than many first-line programming managers. Nevertheless, management is seen as the road to wealth.

What does it take to be promoted into management? Some believe that if you keep your head down, do your job well and put in long hours, you will be rewarded with promotion. Some also believe in the tooth fairy. Management slots are filled by higher executives who evaluate the abilities of subordinates that they know. Notice the last three words. You must be known even to be considered; socializing counts.

Socializing, though, is necessary but not sufficient. That is the fatal misunderstanding. After years of struggling to keep up to date, the analyst is promoted to project manager, breathes a sigh of relief and puts away his or her books. It is as if the new executive expected technology to stop. "I don't have to be technically involved. I'm a manager now." Sadder words were never spoken, for the world will not stop.

Within a year, another nth-generation productivity tool is adopted, and the new manager becomes unable to understand fully the work of subordinates. If he cannot understand their work, he cannot evaluate and direct it. Once he can neither lead nor follow, he is brushed aside.

The technologically obsolete first-line manager is doomed. Only two questions remain: How long will it take for the next highest level to do the merciful thing, and how many higher-ups will be lost as well?

I have seen the inevitable job holocaust take down as few as one person and as many as 15, including a vice-president. This needless truncation of promising young careers is just about the only professional problem I face that keeps me awake at night.

Why do women risk more for less gain than men? Because the sad fact is that it is nearly impossible for a female to become close friends with a male middle-management executive. This leads to two problems for the woman manager: First, middle managers are human and thus more likely to cushion the fall of a faltering first-liner if the two are personally close. Incompetence, in other words, is more likely to be forgiven in a man than in a woman. It is unfair but true. Secondly, a woman is more apt to misread the boss she is emulating since that boss is probably a man. He may act indifferent to changing technology, so she becomes indifferent.

But it takes more than superficial acquaintance to realize that the easygoing administrator you see at the office is busting his Apple learning Visicorp's Visi Calc at home. ‡

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31 Manager/Supervisor Programming
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D. Communications Systems
E. Office Automation Systems

CW-139

IN DEPTH

The coming day of fault tolerance

By Wilbur H. Highleyman

A little more than four years ago, my In Depth series, "Survivable Systems" [CW, Feb. 4-Feb. 25, 1980], appeared in *Computerworld*. At that time, Tandem Computers, Inc. offered the only commercially available fault-tolerant system, the Nonstop. Now that there are about two dozen offerings from domestic and foreign manufacturers, it is clear that fault tolerance has been accepted as a concept with a future.

As with memory and languages and operating systems, fault tolerance will become a subconscious requirement. We just wouldn't think of building a system without it.

It is my guess that within the next 10 years fault tolerance will be as common as higher level languages, multiuser operating systems and megabyte memories.

I first became involved in fault-tolerant systems in the mid-1960s, when my company at that time, Data Trends, Inc., built a triplexed totalizator system for the New York Racing Association. The system was designed for the Aqueduct, Belmont and Saratoga racetracks and used Honeywell, Inc. H200s. Remember them? They were 6-bit machines designed for commercial data processing.

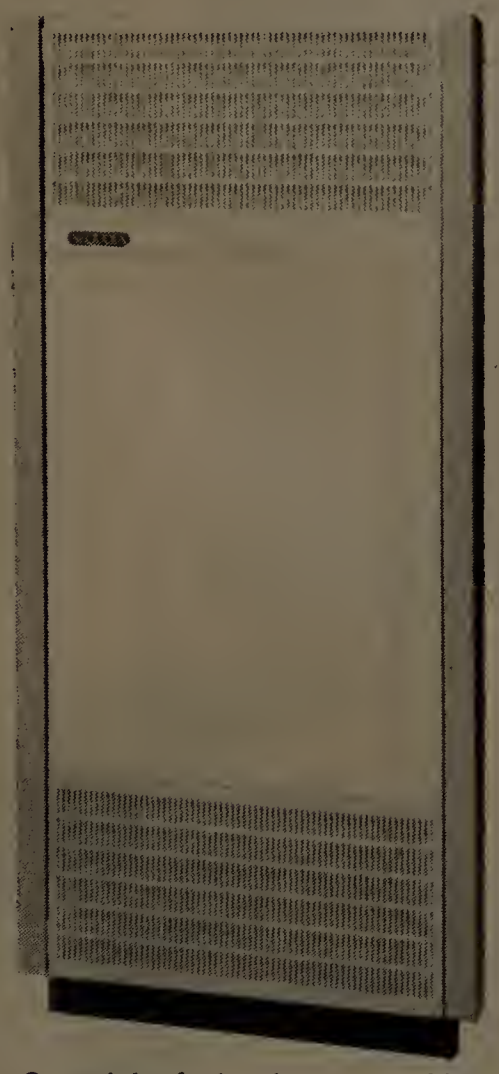
The system was quickly followed by a network of duplexed Digital Equipment Corp. PDP-15s acting as the telex switches still used by ITT World Communications, Inc. The floor of the Chicago Board of Trade was first automated with triplexed DEC PDP-8s.

The Sombers Group was later involved with other systems. One included telex switches for the British Post Office using General Automation, Inc.'s SPC-16. Another, the data base manager for the (New York) *Daily News* editorial system, used duplexed Prime Computer, Inc. 200s.

All of these fault-tolerant systems were pre-1976, and all had the following characteristics:

- Each used a homegrown operating system supporting a fault-tolerant strategy that was quite specific to the application.
- Each ran as a single processor with a shadow standby that could take over without losing a transaction (or a call in progress). Triplexed systems simply provided a third cold standby.
- Memory sizes were small by today's standards (16K bytes to 64K bytes).
- All programming was done in assembly language.

In those days, we built the systems from scratch and squeezed the last bit of performance



Sequoia's fault-tolerant machine, to be introduced Sept. 18



The Stratus strategy: hardware redundancy



The Nonstop TXP from Tandem Computers, Inc.

Federal DPers will meet on fault tolerance

Wilbur H. Highleyman will speak on state-of-the-art fault tolerance at the Federal Computer Conference, to be held Sept. 18-20 at the Washington, D.C. Convention Center.

This seventh annual event will include sessions, workshops and professional enhancement seminars.

More information is available from the Federal Computer Conference, 286 Boston Post Road, Wayland, Mass. 01778.

out of the hardware. After all, hardware was expensive, and software was cheap (at least, that was management's perception).

Then came 1976 and Tandem, and our little world of custom fault-tolerant systems turned upside down. Tandem had the daring to introduce a generic fault-tolerant product — one that was applicable to almost any application. Just learn to checkpoint, Tandem said, and you can build any application to run fault tolerant.

Tandem was right. The custom fault-tolerant business of The Sombers Group vanished almost instantly, to be replaced with experience on dozens of new Tandem-based systems. Of course, checkpointing did not turn out to be the trivial exercise touted by Tandem. And there were failure windows not even anticipated. But with ever-increasing experience and continuing improvements in Tandem products, the building of these systems has become more straightforward.

Today, these systems can be found in almost any application, except those which require ultra-fast response time or are products aimed at very low-cost markets (these are still candidates for custom operating systems).

The most amazing part of the Tandem story is that the company held this market captive for six or seven years — unheard of in today's technology. It was not until 1982 that Stratus Computer, Inc. became a serious competitor. Synapse Computer Corp. emerged next, followed by dozens of others. Now, within just two short years, the field is full with fledgling hopefuls. Each brings a new idea to the fault-tolerant marketplace — a new piece to the puzzle — begging the question of where is all this going.

What is fault tolerance?

As a general statement, a fault-tolerant system is one in which any failure is transparent to the user. However, this general statement is unusually demanding. For one thing, it implies that any sequence of failures will be user-transparent. The reliability of today's hardware is such that tolerance of any single failure is sufficient, given sufficiently rapid repair time.

The statement also makes no allowance for reduced performance in the (presumably) rare event of a failure. This is often tolerable, as long as all functions are still available to the user community. We will therefore use a relaxed definition for purposes of the following discussion: A fault-tolerant system is one in which any single failure is functionally transparent to the user.

In order to be fault tolerant, a system must have the following characteristics:

Redundancy. Each critical component must be replicated so that it can be replaced upon failure.

Fault detection. The system must be able to identify automatically a component that has failed.

Isolation. The failed component must be isolated, electrically and logically, from the rest of the system.

Reconfiguration. The system must reconfigure itself to continue uninterrupted operation in the presence of this fault.

Repair. The faulty component must be repairable without affecting normal ongoing system operation.

Recovery. Once repaired, the failed component must be reintroduced into the system.

Data base integrity. No failure mode shall be allowed to contaminate the data base.

What's happening now?

Tandem, located in Cupertino, Calif., is the granddaddy of generic fault-tolerant systems. Tandem introduced a multicomputer system in which up to 16 independent computers were interconnected by a dual high-speed bus. Within this structure, fault tolerance was implemented via software. Each operating program (or process) running in one computer could have a back-up process running in another computer.

Via software-implemented checkpoints at critical points in the process, the back-up process is informed of the primary process' exact state. Thus, if the primary process should fail (due to a processor failure, for example) the back-up process could take over very quickly (within seconds) from the last known state. Done properly, the user is unaware of the failure.

Given that Tandem's approach reflected the technology of the mid-1970s, it was a very advanced concept and obviously is holding its own today. (Tandem continues to command the bulk of the market for fault-tolerant systems.) However, this "software" approach has certain drawbacks. Checkpointing imposes a nontrivial system overhead, and the understanding and generation of solid checkpointing strategies is a little-understood art.

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Natick, Mass., introduced a totally new idea — fault tolerance strictly through hardware redundancy. Taking the Stratus processor as an example, it is really four microprocessors (Stratus uses the Motorola, Inc. 68000) arranged as two pairs of duplexed processors. All four microprocessors are run in lock step at the system clock frequency. The outputs of each microprocessor within a duplexed pair are continually checked for consistency.

As long as all outputs are the same, both pairs operate in parallel. If one duplex pair should find an inconsistency, it immediately disconnects itself from the system bus, but the other duplex pair continues operations.

Along with its equally secure memory, disk and communications units, a Stratus "processing module" will continue uninterrupted processing in the event of any single failure. Stratus allows up to 32 processing modules to be connected via a high-speed bus, although this capability is used solely for expansion and not recoverability as in Tandem's case. (Note: To be more accurate, each Stratus processor really is made up of a multiple of four microprocessors, since there is one set for executive work and one or more sets — depending on the model — for application work. Each set is quadraplexed and runs in lockstep.)

Hardware approach

Stratus solved the overhead problems of Tandem's software approach through its "hardware" approach of quadraplexing. On the surface, this appears to be a more expensive, though higher performance, solution. However, it is not clear from actual field experience that either is true: Both systems appear to be price/performance competitive.

Then enter Synapse Computer Corp. of Milpitas, Calif. Synapse argues that the multicomputer approach of both Tandem and Stratus is inefficient for two reasons. One is that many applications require several cooperating processes, especially in transaction processing. Terminal requestors communicate with transaction servers, which communicate with a data base manager.

In loosely coupled systems such as these, the interprocess communications mechanism is lengthy (typically a few milliseconds) and represents a significant portion of the system load. Secondly, though the load of the system can be shared among the computers, it cannot be easily dynamically balanced, since processes must be preassigned to a particular computer. It is not uncommon for one computer to be running at 90% to 100% load while others are running at 10% to 50% load.

Synapse introduced a closely coupled multiprocessor system (as opposed to a multicomputer system) in which up to 28 general-purpose or I/O processors (again, the Motorola 68000) use one common memory. This improves efficiency in two ways. Interprocess communications is now via direct memory and is measured in microseconds rather than milliseconds.

Furthermore, all general-purpose processors can work off a common task queue, thus keeping all equally busy. A process is no longer assigned to a single processor; on each dispatch it is assigned to the next free processor.

Contaminate memory

Of course, a closely coupled architecture has a horrible fault-mode because any sick processor, through certain hardware failures, can contaminate main common memory. And the failure of a main memory module also represents a catastrophic system failure. Synapse, therefore, addresses fault tolerance with a somewhat different philosophy. The company submits that, in many applications, it is perfectly reasonable to require users to reenter their current transaction in the event of a failure — provided that failures are infrequent and that the integrity of the data base is maintained.

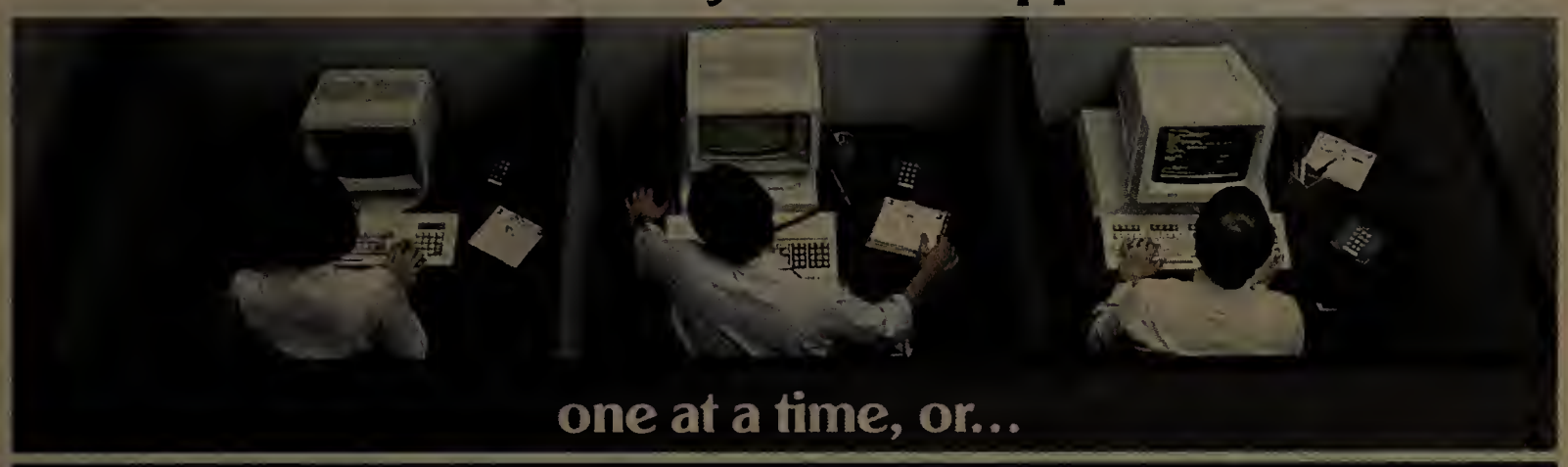
To this end, Synapse maintains sophisticated logs of all disk activity. In the event of a failure of any kind, the system is brought down, automatically reconfigured, and any transactions in progress are rolled back. It may take a few moments a few times a year, but Synapse argues that the resulting price/performance of its "transaction" approach to fault tolerance far outweighs this inconvenience.

A common thread of all of these systems is expandability and transparency. Applications can be written and systems installed without worrying about outgrowing the size of the box. If volumes increase, functions proliferate, or (heaven forbid) the application was underestimated, simply add modules — more processors, more disks, more terminals, whatever is needed. And if you fill up a system or need to distribute it,



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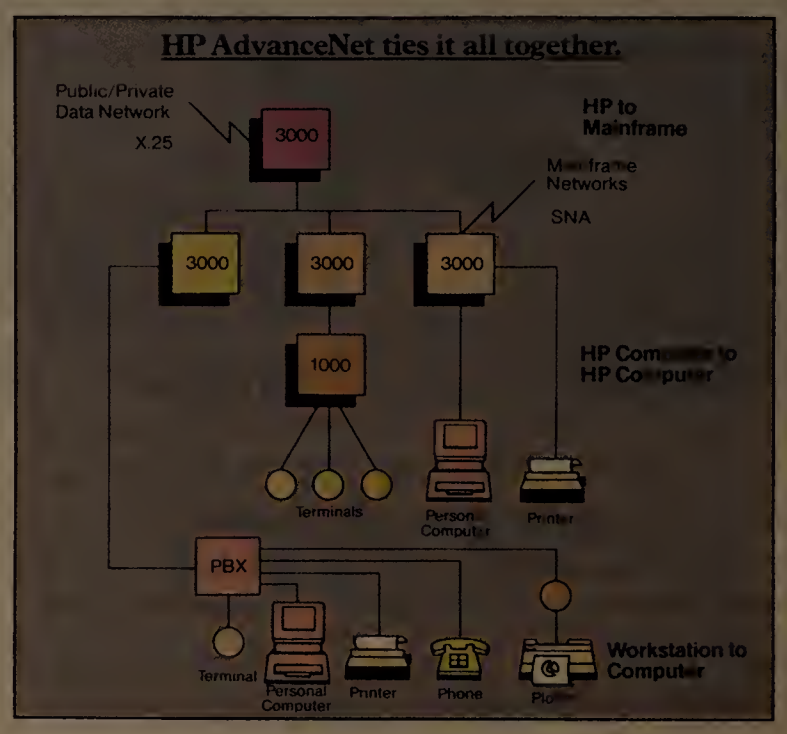


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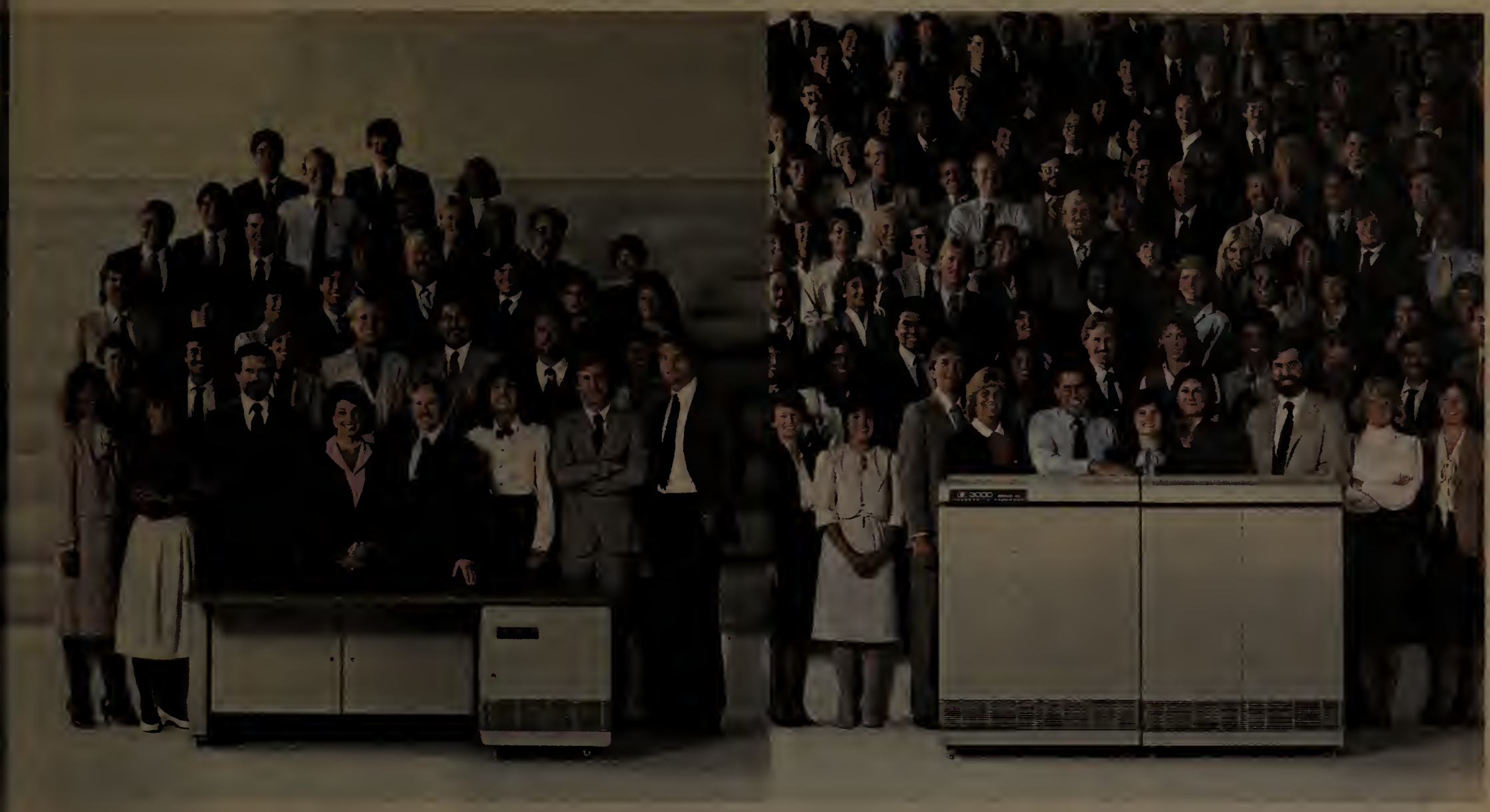
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Of course, a closely coupled architecture has a horrible fault-mode because any sick processor, through certain hardware failures, can contaminate main common memory.



The Unix-based Auragen System 4000

interconnect multiple systems with anything from local-area networks to satellite links.

The beauty of this expandability is its transparency to the applications programs. The operating system knows the name and whereabouts of every processor, file and peripheral in the system. As these are moved around in an expanding system, the applications programs need know nothing of this configuration change and, therefore, require no modification. A few minutes of modifying the system generation parameters does it all.

Service is another area of innovation. Tolerance of a single failure is only of value if that fault can be rapidly repaired. Led by Stratus Computer and followed by some of the newer entries, a failed system will automatically place a call to a centralized service facility. The fault can be diagnosed over the dialed data link, and a replacement component is sent by courier overnight to the customer for replacement. Often, the customer will receive the replacement component before he has even noticed the system alarm designating a failure. I suppose all that is left is training the courier service to also replace the part.

Three philosophies

We now have three distinct fault-tolerant philosophies introduced by the first three entries (at least, domestically) into the generic fault-tolerant field. There is the software approach by Tandem, the hardware approach by Stratus and the transaction approach by Synapse.

Each approach has its pluses and minuses, perhaps most easily expressed by the minuses. The software approach imposes system overhead, the hardware approach imposes hardware overhead, and the transaction approach imposes recovery time overhead. It is interesting that the newcomers to the field following Tandem, Stratus and Synapse use one or a combination of these techniques.

Auragen Systems Corp. of Fort Lee, N.J., offers a multiple computer system in which up to 32 processor clusters can be interconnected via dual high-speed buses. Each processor cluster is an independent computer system which is itself a closely coupled configuration of three microprocessors (one executive and two application processors) communicating with its own common memory, files and peripherals.

Auragen's fault-tolerance approach is similar in many ways to Tandem's software approach, except that checkpointing is done automatically at the operating system level. Therefore, it requires no application awareness and is more efficient during normal operation, but with longer recovery times. Auragen's fault-tolerant system is a Unix-based system. The company claims that any Unix program will run fault tolerant with no changes.

Tolerant Systems Corp. of San Jose, Calif., has announced a system in which multiple System Building Blocks can be configured in a variety of ways. Each System Building Block contains two National Semiconductor Corp. 32032 microprocessors (one for real-time executive work and one for application tasks), memory and I/O interfaces.

In a typical configuration, System Building Blocks are configured in



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Some boards of directors don't want to hear anything but Big Blue, and Big Blue doesn't have a fault-tolerant system. But even this argument is dissipating as granddaddy Tandem rapidly approaches becoming a billion-dollar company.

pairs for handling specific system functions. For instance, one pair of building blocks would act as communication servers, one pair as application servers and one pair as file servers. Normally, both System Building Blocks in a pair would share the load.

However, if one fails, all traffic is passed through the surviving building block. Tolerant's system recovers from a fault via a transaction recovery similar to Synapse. Incomplete transactions are backed out of the data base, and the user reenters those once recovery is complete.

Sequoia Systems in Marlboro, Mass., combines the hardware and transaction approaches. Its product, to be introduced Sept. 18 at the Federal Computer Conference in Washington, D.C., is a closely coupled system like that of Synapse. Up to 64 general-purpose processors and 96 I/O processors communicate with common memory over a pair of high-speed buses.

Unlike Synapse, each general-purpose processor is composed of a pair of Motorola 68000 microprocessors operating in Stratus-like lockstep. Thus, each is completely self-checking. Memory elements and I/O processors are also self-checking. Like the Synapse system, if there is an error, incomplete transactions are backed out and restarted following recovery.

Modified stance

Nohalt Computers, Inc. of Farmingdale, N.Y., takes a modified stance on fault tolerance. In its Failsafe system, up to 16 application processors communicate with a mirrored, redundant data base manager. Each application processor provides a single user environment, supporting a user terminal and up to three other peripherals associated with its application, such as a printer or a communications line. If there is a failure in the data base manager, system operation continues. A failure in an application processor will take that user out of service.

Parallel Computers of Santa Cruz, Calif., provides a system in which up to five parallel processing units can communicate over a single simplexed bus to disk controllers and communications controllers. Each parallel processing unit is actually two processors, each Motorola 68000-based. Each half of a parallel processing unit is independently processing the same transactions as the other half. The unit halves checkpoint to each other to keep each one in sync with the other's progress. If one fails, the other carries on.

The above systems represent many of the current domestic entries in the generic, expandable fault-tolerant system market (though the Parallel system is aimed more specifically at supervisory control and data acquisition applications). Other systems worth noting that are less generic and not expandable are from August Systems, Inc. and Syntrex, Inc.

August Systems, of Salem, Ore., markets a triplexed voting system to the process

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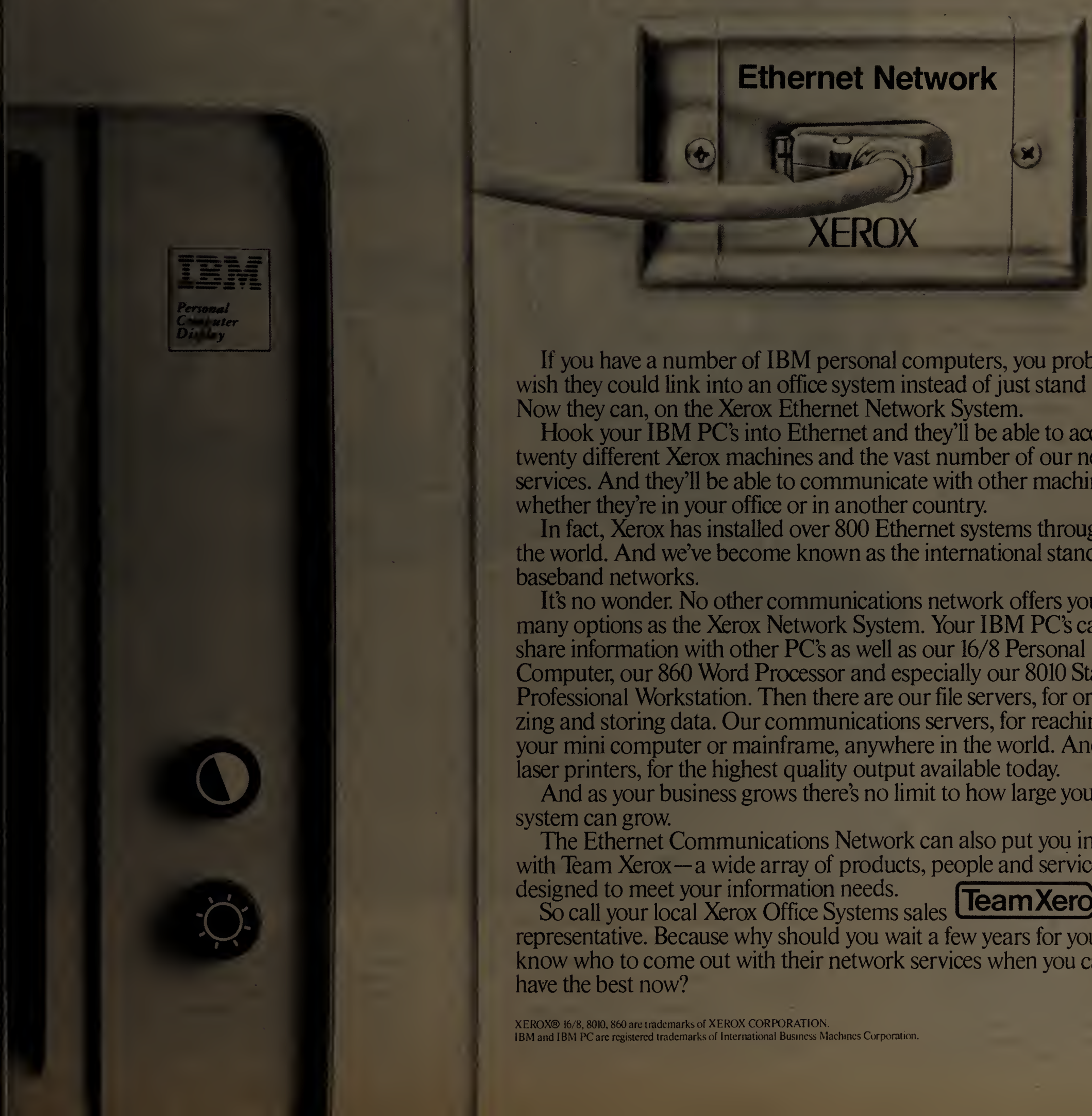
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Syntrex, Inc., of Eatontown, N.J., markets its fault-tolerant Gemini system to the word processing market. Similar in architecture to the Nohalt system, Gemini is composed of an 8086-based redundant data base manager and up to 14 8086-based intelligent Aquarius terminals. A failure in the data base manager is transparent to the user, whereas an Aquarius failure puts that user out of service.

Of noticeable absence in the above discussion are the major computer manufacturers established prior to Tandem. Not one has announced a generic, expandable fault-tolerant system, though there are some entries in one form or another. Both Perkin-Elmer Corp., with its Resilient system, and AT&T, with its 3B20D, market a dual-processor fault-tolerant system. But once the user grows out of this "box," he is faced with difficult decisions on how to expand. With Perkin-Elmer, the user at least can climb the 3200 product line, from the small 3205 to the powerful 3200 MPS.

And then there is DEC, the perennial hopeful for a major entry in the field. After one false announcement and rapid withdrawal, DEC finally announced VAX cluster, which can support up to 16 nodes interconnected by a high-speed dual bus. Each node can be a VAX (780 or 750) or a disk control unit (hierarchical storage controller). DEC has delivered VAX cluster hardware, but software is still forthcoming, even for such elemental operations as file sharing, not to mention file mirroring and fault recovery. And it appears that fault recovery will be implemented by checkpointing process context to disk — a backward step from software checkpointing?

Shaping the future

Some interesting common paths are beginning to take shape that may set a precedence for future offerings. One is the embracing of the software, hardware and transaction-recovery techniques introduced by Tandem, Stratus and Synapse. So far, there do not appear to be any new philosophies beyond these introduced.

Another common path is the inherent expandability of these systems. I would not expect to see any new ventures introducing systems limited to dual processors. And still another is the wealth of software tools that have come to be expected, from the normal complement of higher level languages to networking, data base management and transaction processing tools.

Development efforts appear to be focusing (and appropriately so) on the use of existing technology to reduce development effort. To wit, with respect to the newcomers:

Processor — All but Tandem use microprocessor technology. Five use Motorola 68000 (Stratus, Synapse, Auragen, Parallel and Sequoia).

Operating system — Many of these systems are Unix-based, including Auragen, Tolerant, Sequoia, Nohalt and Parallel.

System language — All use a high-level language for a system language. C is predominant and parallels the use of Unix.

Data base manager — More and more, an existing data base management system is being ported. Stratus is using Oracle Corp.'s Oracle, and Tolerant is using IBM's SQL. I have heard of others, as yet unconfirmed.

All of this flurry of activity is not without its problems. Several of the new start-ups have been delayed in getting their product to the marketplace. And DEC still has not delivered its promised VAX cluster software. But the march goes on, and the breadth of available fault-tolerant computing systems grows with the months.

When to consider

When does it make sense for you, the user, to consider going to a fault-tolerant system?

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And then there is DEC, the perennial hopeful for a major entry in the field. After one false announcement and rapid withdrawal, DEC finally announced VAX cluster, which can support up to 16 nodes interconnected by a high-speed dual bus.

fault-tolerant system. The cost of a failure is the cost of lost business, idle workers and perhaps contingent liabilities incurred while the system is down. The downtime of a system is that time it takes to repair the hardware plus the time it takes to repair a corrupted data base, which could be many times the hardware repair time.

For new systems in which conversion is not a problem, the incremental cost of fault tolerance is rapidly approaching zero. After all, if a multiprocessor system is sharing a load across all its processors and if the overhead imposed by fault-tolerant considerations is minimal, a fault-tolerant system should be just as price/performance efficient as any other system. A look at today's offerings will verify that. And you get invaluable expandability as a freebie.

About the only reason not to go to fault tolerance for new systems today is because of management's concern for vendor stability. Some boards of directors don't want to hear anything but Big Blue, and Big Blue doesn't have a fault-tolerant system. But even this argument is dissipating as granddaddy Tandem rapidly approaches becoming a billion-dollar company.

Why haven't the major manufacturers entered this market? Good question with hazy answers. First, the perceived size of the marketplace may not yet be attractive. IBM certainly has proven that the personal computer market is a hotter trail to follow, at least for itself. Second, there is always the nagging problem of competition with existing product lines. And third, I am sure that the major manufacturers recognize the significance of the technological pitfalls in such a product development.

All that notwithstanding, I look at the development of fault tolerance in light of other breakthroughs that were major in their time, but are commonplace today. In the field of minicomputers, for example, 8K bytes was a lot of memory 15 years ago. Now, megabyte memory capabilities are taken for granted. Ten years ago, Fortran was about the only high-level language available for minicomputers, and multiuser operating systems were still unavailable. Would you even consider buying a mini today if it did not support many languages in a multiuser interactive environment? Of course not.

And so it goes with fault tolerance. As fault tolerance becomes more available as a near-zero cost option from major manufacturers, with unlimited expansion as an added plus, more and more new systems will be built as fault tolerant. As with memory and languages and operating systems, fault tolerance will become a subconscious requirement. We just wouldn't think about building a system without it.

How long? Anybody's guess. But based on past experience, it's got to be less than 10 years.

About the author

Wilbur H. Highleyman is chairman of The Sombers Group, Inc., Mountain Lakes, N.J., which specializes in turnkey software packages for on-line systems. Highleyman has nearly 30 years of experience in the development of real-time, on-line data processing systems, with particular emphasis on multiprocessor fault-tolerant systems and large communications-oriented systems. Highleyman is also founder and chairman of Minidata Services, Inc. and president of the Northeast Region Tandem User's Group.

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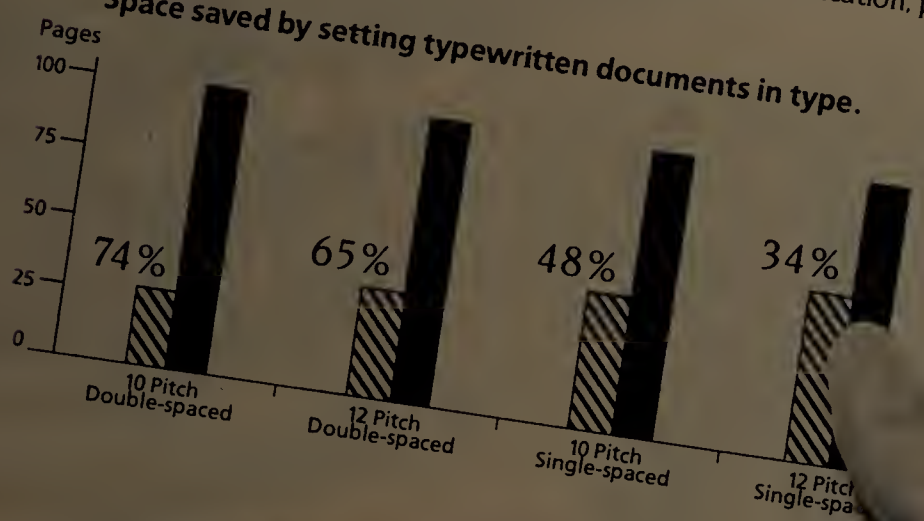
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COBOL

Defender

Cobol is still alive and growing. It's not alone in having flaws. Cobol's demise has been predicted annually since 1959, but that doesn't seem to have happened. Perhaps severe critics like Conner should take part in the development of the language instead of taking potshots at it.



Editor:

In your issue of May 14, you included an article by Richard Conner attacking Cobol. Obviously, Conner is not at all aware that Cobol is still being developed, and he is completely wrong in many of his statements about what Cobol has and does not have. True, most implementations in the field have several of the shortcomings mentioned, but some do not, and in a year or two most will not. **(Point No. 1)**

The history segment in his article was about right. And, as stated, Cobol is still stuck with many things that shouldn't be there. Any attempt to do away with such features meets with hysterical reactions from the multitudes. Such reaction is unfortunate, but that is the way it is. I find it interesting that Conner faults language development by committee. I assume he thinks Fortran, Ada, PL/I and so on are all fine. All were developed by committees. About the only major language I can think of that was not is Pascal, and it is certainly not without faults. **(2)**

He also indicates that maintenance and productivity goals were not met with success. However, the only other tools in those days were assembly languages and the like. Cobol is obviously easier to maintain and develop than assembly language. True, some Cobol programs are very difficult to maintain. Most of this difficulty is caused by poor programming, and even the best languages suffer from it. I have seen maintenance nightmare programs in almost every language (the worst were in Fortran), including Ada.

However, one of the Cobol language developer's goals is to reduce maintenance and development costs. The proposed standard (called 198x most of the time) will do just that. The current implementations of major parts of it (Control Data Corp. and Digital Equipment Corp. have them now, and IBM has one in beta test for release next January) have purportedly reduced such costs by about half. With proper use, the reduction can be even more. **(3)**

It is interesting to note that Conner indicates that several useful features never found their way into Cobol. He lists parametric procedures (I'm not sure what these are, but I assume he means procedures that can be called within a program, are included in that program and can be passed parameters), which are included in the 198x standard and were added to Codasyl Cobol in 1978; the case construct, which is included in the 198x standard — also in Codasyl Cobol in 1978; string operators, which are in the 1974 standard and are in almost all current implementations (I can only assume he is only familiar with 1959 Cobol); and functions. Intrinsic functions have been in Codasyl Cobol since 1980, and I am currently working on a proposal for user-defined functions. **(4)**

His comments about reserved words being caused by time pressures are wrong. There are serious problems with languages without reserved words. That is why most modern languages like C, Pascal, Ada and so on all use them. True, none use as many as Cobol, but none are as powerful, either.

The reserved word problem is not a problem at all in reality. It is something easy to focus on because everyone can understand it. In the days when there

(Continued on ID/16)

On May 14, In Depth published an article titled "Cobol, Your Age is Showing," by Richard Conner. The volume of letters from readers surpassed the response to any feature appearing in the past year.

On June 11, In Depth added Jerome Garfunkel's "In Defense of Cobol" to the debate.

Today we bring together the Cobol critic, Richard Conner, with one of Cobol's foremost defenders, Donald Nelson, the chairman of the Codasyl Cobol Committee.

The forum is a limited debate, which begins with Nelson's letter to the editor in response to Conner's original article. Then follows Conner's rebuttal and some final thoughts by Nelson.

After these letters, we present interviews with both Conner and Nelson conducted by Seattle-based Roger Knights.

Knights' interest is to bring Conner and Nelson to some middle ground of understanding of Cobol's abilities and liabilities. On some points, he succeeds. On others, no amount of discussion seems likely to reconcile a Cobol critic and a Cobol defender.



ILLUSTRATIONS BY H. FLING

Critic

My differences with Don are real. But they should be regarded with one thing in view: I'm discussing Cobol as it is and has been; he emphasizes what Cobol should or will or might become. I assess the effects of what we've done; he discusses the means of doing better in the future.

Editor:

I read with great interest Don Nelson's thoughtful letter. He scores some palpable hits . . . and he misses my points sometimes, either because my writing was too elliptical or because his reading was too cursory. I'll meander along his letter sequentially.

1. Unfortunately, there is an enormous mass of Cobol programs being "maintained" today that were written to be compiled by "most implementations in the field." That goes to the heart of my complaint: "Cobol was born flawed." My complaint was that the inadequacies that have prevailed for various periods have tended to prevent coherent programming in Cobol.

2. In an early draft, I said that one should be wary of work done by committees: We know the well-worn definition of a camel. I further qualified the observation by noting that some outstanding things have emerged from committees — the U.S. Constitution, for one. Don acknowledges the weakness of the committee method in the same paragraph when he talks about "hysterical reactions from the multitudes."

I'm not sure Don's facts are straight. The Fortran "committee" consisted of one person, John Backus. The APL "committee" (albeit Don doesn't mention APL) consisted of one person (later of two with extraordinary synergy). I don't know much about Ada or Pascal, other than to feel that they are largely redundant, may have been politically motivated and that Ada has received much criticism.

I don't fault language development by committee *per se;* I merely suggest that the odds of getting an excellent product are reduced when its development is entrusted to a committee.

Basically, Don's assumption that I think the languages he mentions are still fine may not be too wide of the mark. But if any of them is fine, its merit, in my view, arises more despite its development by committee than because of it.

3. I'm persuaded that a *well-written* Cobol program (for an application appropriate to Cobol) may be easier to maintain than one written for the same application in assembly language. However, much depends on other factors. For example, macros make the assembly language open-ended, while Cobol has no such open-endedness.

I do agree that maintenance troubles stem largely (if not mostly) from poor programming practices. I didn't have (or take) the space to develop the idea — shared by Edsger Dijkstra.

Again, Don mentions forthcoming features to relieve maintenance stress, but my article was about the morass created by 25 years of (poor) Cobol use.

Don says that implementations with some of the features that may appear in 198x Cobol have "purportedly reduced [maintenance and productivity] costs by half." Measurement of maintenance costs and productivity benefits has long been a tough nut to crack (see "A user challenges value of subsecond response time," by Lawrence Kosmatka, CW, June 11). The "purported" reduction is impossible to evaluate without knowing the assumptions and methodology behind its determination.

If, indeed, such improvement has occurred, why have we had to wait a quarter century and more to see it come

(Continued on ID/16)

Defender

(Continued from ID/14)

were no text editors, it was more troublesome; but today it is trivial to change word conflicts.

Also, 198x Cobol includes a statement to help change such words. I agree that it would be better if there were a good way to eliminate them, but none has been found (especially not the Fortran and PL/I methods). I also find it interesting that Conner complains about the maintenance problems with Cobol when the lack of reserved words contributes heavily to the maintenance problems with those languages. **(5)**

True, the DEFINE facility was taken out in the 1960s. I have heard it was because that facility was ill-defined, not because users had not implemented it. We do have a simple string substitution facility (called REPLACE), but it does not allow substitution of parameters. Actually, I have found heavy use of macros to contribute heavily to the difficulty of maintaining some programs (mainly in Algol-like languages). A comprehensive macro facility was proposed two years ago, but it was rejected. It appears this rejection occurred because of the "Tower of Babel" that might result from the proliferation of heavy macro usage. **(6)**

Conner indicates that it is wonderful to program in assembly language. He must be kidding. Sure, for trivial programs on your personal computer it is sporting, but for major applications, it is a disaster. I know, I've been involved in such things in the past and never care to again. Note that he said their staffs were "playing with personal computers . . ." That's just it. Basic and assembly language are fine for playing and learning some fundamental stuff, but terrible for large system development. The trend today is toward nonprocedural languages, and Cobol is following that trend. **(7)**

I agree that many of the problems Conner identified regarding programmers do exist. However, most of them have to do with individuals and training methods, not Cobol. There are more Cobol programmers than any other kind, and obviously there will be more problems with such programmers just because there are more of them. **(8)**

In summary, Cobol is still alive and growing. Obviously, it has its many flaws, but it certainly is not alone in that respect. Its demise has been predicted annually since 1959, but it doesn't seem to have happened.

Perhaps severe critics like Conner should take part in the development of the language instead of ignoring development efforts and then taking potshots at it. **(9)**

Sincerely yours,
Donald F. Nelson
Chairman, Cobol Committee
Conference on
Data System Languages

Critic

(Continued from ID/15)

about? And if it has occurred, my contention that the language is faulty is reinforced.

4. Don rightly takes me to task for not defining the coined term "parametric procedure." But he rightly divined my meaning. Forgetting standards and talking about implementations — which are more or less agreed standards — I've worked with INSPECT, STRING and UNSTRING, including creation of parsers of free-form applications languages. It's laborious, to say the least. Many programmers I've talked to have feared to use them because they lacked the patience or the brains to work their way through the descriptions of the syntax of these operators. (Note: the features were "late," not nonexistent, in Cobol.)

5. Since Don doesn't elaborate on the maintenance problems with programs written in languages without reserved words, I can't react. My own experience has been that the Fortran and PL/I methods of eliminating reserved words are excellent — they are closely analogous to the ways that English, French and so on eliminate them and thus, I believe, are easily apprehended by the programmer.

Don's minimalization of the reserved word problem (ease of revision with text editors) is like saying that a tire blowout is no nuisance because you have a spare in the trunk.

Saying that a problem is easy to correct is no way to refute the assertion that the problem exists. Is it not better to avoid creating the problem in the first place?

6. Regarding "macro" facilities, Don doesn't really respond to me. To the extent that a facility (which I assert is valuable) makes maintenance difficult, I suggest that the facility has been misused. I'm not necessarily a believer in *vox populi*, but it seems that Cobol is the only major procedural programming language that has no macro facilities.

7. I never indicated that it is wonderful to program in assembler language. I mentioned assembler language in illustration of the quite different point that a good programmer can quickly pick up another language. It *may* be "wonderful" to program in assembler language. As I indicate later on, it depends . . .

8. See my remarks about language being an important determinant of modes of thought.

Of course, it is not obvious that there will be more problems with Cobol programmers than with any other kind. In absolute numbers, perhaps, but not by any means in percentages — which are what count.

I tried to qualify my remarks about Cobol by saying that the language *contributes* to the problems, not that it is the cause of them. But if

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I've been simplistic, so has Don.

9. Opinion must reign here. I perceive already the relative decline of Cobol. The decline may be less attributable to espousal of other languages by users than to structural changes in the industry. The use of packages increases. The manufacturers of the packages — if they are to survive — must choose the most cost-effective mix of development, maintenance and enhancement tools, including languages. Some use Cobol extensively, particularly when they provide source code. I expect a growing number to stop distributing source code and to offer customers the necessary flexibility through parameter-driven "system generation" processes.

A second source of the decline of Cobol is the growth of "nonprocedural" languages. I once wrote an interactive screen-oriented package in Cobol. I estimate it took at least 20 times the energy that it would take with currently available packages for development of interactive applications.

An increasing number of users I talk to say that their use of Cobol is tending toward maintenance of systems that have been around awhile, while they use Cobol less and less for new development.

My prediction is that the DP world is maturing to the point that it will make no more sense for most organizations to manufacture their own software than it does for them to manufacture their own pencils — they'll either buy it off the shelf or have it built (like, say, an office building) by outside specialists. Again, those specialists and manufacturers will choose "cost-effective" tools. And I doubt that Cobol will often be among those tools.

The Basic story with micros reminds me of the Cobol story with "mainframes." I think that many will agree that Basic is miserably cost-ineffective for most application development. Yet I imagine that most micro applications were written in Basic. Fortune and leadership in the industry await the software house that takes a longer view, that invests in the research and development to devise a more cost-effective language. (And C may be it — or PL/S.)

My position, I guess, boils down to an eclectic one. A set of languages should be used in a system according to the suitability of a given language for the task at hand. There is not — nor will there ever be — a single best programming language in this world. What we need is the wisdom to select from among the collection of admittedly imperfect tools at hand those that help us do the best job we can.

My complaint in the article was something like a protest against the common practice of saying: "Cobol is the shop standard, period. No exceptions without approval from the board of directors and betting your job on your success, and so on." That, however, is about management, not about languages.

My differences with Don are real. But they should be regarded with one thing in view: I discussed Cobol as it is and has been; Don's discussion emphasizes what Cobol should or will (or might) become. I assess the effects of what we've done; he discusses the means of doing better in the future.

I'm quite willing to consider taking part in the development of the language. I wish I'd been invited to years ago. I trust that Don's characterization of my remarks as "potshots" was a spontaneous reaction to my intentionally provocative article. Although my technical criticisms were confined to ones I thought would adequately serve as illustrations to help make my points, I'm prepared to defend my propositions formally and to develop them (and others I didn't state) through reason and logic.

Best regards,
Richard Conner

Nelson responds

Editor:

Here are my responses to Mr. Conner's letter.

1. So what is wrong with improving the language, even though existing programs will benefit only by osmosis?

2. "The multitudes" referred to the users, not the committee members. The Fortran committee (X3J3) now has 45 people on it and has been developing Fortran for 25 years or so. Both Fortran and APL have "received much criticism," despite their initial design by one man.

3. But Mr. Conner's article wasn't just about the past; he said to abandon Cobol completely. He was addressing the future as well.

4. Regarding INSPECT, STRING and UNSTRING: Once I spend five minutes with the fraidycats, I am able to show them how simple it really is.

5. Reserved words: Ada and Pascal decided that the minor nuisance was better than the complex methods of eliminating reserved words (complicated punctuation or one statement per line, ambiguous readability and so on).

6. Fortran, Ansi PL/I, Algol, Ada, Pascal *et al* don't have macros.

7. Screen-oriented development is easy in 8x Cobols with screen-handling features, like Tandem's.

Maybe 8x Cobol will arrest the decline in the use of Cobol for new development.

Outside software developers will want a standard tool that runs everywhere.

Everybody's invited to participate in Cobol development.

My use of the word "potshots" was a "spontaneous reaction."

Sincerely yours,
Donald F. Nelson



An interview: Cobol critic

As a programmer primarily in PL/I, do you think that you have difficulty with Cobol at least in part because of a PL/I mindset? Don't you think that a Cobol programmer, who thinks in Cobol, would feel less frustrated with the language than one who thinks in PL/I? Wouldn't he be able to throw off chunks of code more naturally when faced with a problem?

Conner: To the extent that I've been a programmer, it's not been as a "PL/I programmer," a "Cobol programmer" or a "_____ programmer," where "_____" can be replaced by any language, architecture, industry or application you care to name. A properly trained programmer thinks primarily in terms of programming, only secondarily in terms of a particular language. Having thought out the solution to his problem as an ordered, controlled collection of processes, transformations and so on, he transliterates it into an appropriate source language. It seems to me that the more closely the language approximates his thought processes, the easier the transliteration will be. This is what compilers are about.

If we think in a programming language analogously to our thinking in other kinds of languages (our native tongue, mathematics, music), we restrict ourselves terribly. And, of course, we'll have trouble with a new programming language — because we haven't been thinking like programmers at all.

Much of our trouble has stemmed from shortcomings in training. We inculcate "mindsets" oriented around particular programming languages. To me, the results can be expected: people assume (and assume that others assume) that "all programs should be written in X" or that "Y is the best programming language."

In view of what I've said, I believe that a programmer who thinks in "programming" would feel more frustration with Cobol than with PL/I, because Cobol impedes translating his ideas into action. I don't doubt that someone who has been trained in Cobol and not in PL/I could "throw off chunks" of Cobol code more naturally than he would throw off chunks of PL/I code. The converse is also true. This follows more from the programmer's training than from the language he uses. My position is that a programming language can be a help or a hindrance and that Cobol is more of a hindrance than a help.

You say that second languages can be picked up over a weekend. People who can do that are uncommonly quick, and for them, PL/I might be a better language. But might not it be a worse language for people who aren't that quick — managers, for instance, who might have a hard time judging the quality of the PL/I code produced by their underlings?

Conner: Programmers should be uncommonly quick. I agree with Knuth, Dijkstra and Brooks that programming is an art and a nontrivial one. And I agree with Harvard's president Derek Bok: Why should a very high proportion of the nation's best minds confine themselves to practicing law? We need capable brains in DP, too.

The problem of managerial evaluation of technical capacity of subordinates can be approached in various ways.

Managers are paid, *inter alia*, to evaluate their subordinates. A manager incapable of doing that should be in a different line of management (or a different line of work). If the evaluation requires reading, understanding and criticizing programs, so be it.

Behind your question lies the assumption that handling PL/I requires greater mental powers than handling Cobol. I question that. Programming requires greater mental powers than other activities — let's keep that in mind. Besides, if you suggested to a self-respecting programmer that he should use Cobol because PL/I (or APL or Pascal or some other language) is too difficult, I suspect his reaction would be one of indignation.

Knights: I'd rather have a language that encourages automatic (nonprocedural) programming and that reduces the need for the programmer's art. So would you, I judge. VALIDATE, UPDATE and ANALYZE are steps in that direction. Report Writer could be expanded to become a powerful applications generator that could regain for Cobol much of its former popularity from stand-alone report generators. Unfortunately, its capabilities have been largely unchanged from the days when it was intended to run on 32K-byte machines.

It's unfortunate that lawyers in the judicial and legislative branches generate "make work" for their confreres by continually expanding the legal sphere, thereby leaching talent from productive lines of work.

But it is also unfortunate that programming (which can be somewhat automated) leaches talent from areas like science, medicine, engineering, management, teaching and so on. The addictiveness of the art of programming for talented people makes it, from a larger perspective, something of an "attractive nuisance."

I agree that a language should interface naturally with the programmer's higher level problem-solving thought processes. Cobol-74 is not a champ at this. A decision

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table structure would provide such an interface; Cobol-8x's EVALUATE statement enables simple (unfortunately horizontal) decision table structures. I hope EVALUATE could be enhanced in the direction of the ultimate in control structures. (For some exciting recent thought on decision tables, see "A Modern Appraisal of Decision Tables: A Codasyl Report," 1982, especially sections 3.6 and 3.9. It is available for $27 from the ACM ordering department, P.O. 64145, Baltimore, Md. 21264.)

It would be contrary to conventional wisdom for Cobol to become strong in this area, but that isn't to say that it couldn't happen. It would be most amusing to see a decision-tabled Cobol bury conventionally structured languages (indented six feet down) beneath a tombstone inscribed "R.I.P. IF-THEN-ELSE." On the other hand, the Cobol Committee pioneered the nonprocedural approach with Report Writer and then failed to follow up with the necessary enhancements. Perhaps that is what will happen again. (It's ironic that Cobol never gets any credit for its pioneering in nonprocedural techniques and is just treated as a purely procedural Brand X.) If PL/I, Pascal and the others had included a DT construct, they might have been dramatically enough better than Cobol to have supplanted it in business programming. Row-and-column structures are excellent handrails.

I believe that a programmer who thinks in "programming" would feel more frustration with Cobol than with PL/I, because Cobol impedes translating his ideas into action.

Weinberg writes in his Psychology of Computer Programming: *"One result of [the Cobol designers' efforts] is that programming managers in Cobol shops do seem to read programs somewhat more than do managers in other types of groups." I think the simplicity of Cobol (relative to PL/I) helps, too.*

Indeed, some of the best minds in computer science (Hoare, Dijkstra) believe PL/I is too difficult, so there's no shame in being in their company. It's better to be one of Dijkstra's "humble programmers" than a difficulty-seeking "self-respecting programmer."

What PL/I features would you like to see in Cobol? Pointers, perhaps? What Cobol features would you like to see in PL/I?

Conner: A programming language is, or should be, organic. So it is difficult to talk in terms of features. On the other hand, since programming languages so far are synthetic and of restricted syntax, some discussion of features can be useful.

Some handy things in Cobol that I'd like to see in PL/I include things analogous to:

- "88" levels. They can, of course, be simulated in PL/I, but the obvious association of mnemonic, test value and data item isn't there. I haven't given enough thought to the subject to devise a suggested way to do it — but it certainly should not be done *a la* Cobol, with a restricted (reserved) level number.
- Placeholders ("FILLER") for items of no interest in a structure. Again, I've devised no proposed mechanism, but PL/DS has an appealing one.

Regarding PL/I features I'd like to see in Cobol: Without meaning to be flippant, my short answer is "all of them."

Knights: Even label variables and extensive default attributes? Features like that, which are too clever by half, won't be added. But some of the better ones are coming, as can be seen from the "Codasyl Cobol Features" list (see ID/28). Reference modification (the equivalent of PL/I's SUBSTR function) should make the use of INSPECT STRING and UNSTRING much less laborious. A few more features, which are in the committee pipeline but aren't yet approved, are:

a. PL/I's LIKE facility (to be given a different name in Cobol, of course, following an unfortunate tradition in all interlanguage borrowing).

b. User-defined functions.

c. A concatenation operator.

What features were there in IBM's Commercial Translator that should have been included in Cobol?

Conner: Jean Sammet's list in the book *Programming Languages* is a good start. It reads: "From the technical point of view, there are several useful features or concepts in Commercial Translator which have not yet found their way into Cobol. These include the use of floating point numbers . . . the truth operator, the ability to specify functions, parametric substitution in the Commercial Translator DO (which is not the Cobol PERFORM), the absolute value operator, the CALL verb, which permits alternate (and thus abbreviations for) data names, and the ability to assign a value to a condition name at object time."

I also wouldn't mind "CLOSE ALL FILES" and WRITE to file (instead of record), for symmetry. In other words, "WRITE file-name [FROM record-name]."

Knights: All features in the first paragraph will be in 8x or 9x Cobol.



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IN DEPTH/COBOL

Don't you think that language-directed editors will solve many of the problems you mentioned with reserved words?

Conner: Language-directed editors may help solve some of the reserved word problems. My beef is that the problems exist. I remember, in my college cafeteria, that when one complained about the vegetables, the response was, "Put salt on them." I never could understand how that could be better than having the vegetables cooked right in the first place — especially when, on particularly bad days, the server would warn us, "Today, salt won't help the vegetables."

Knights: But editors are in use anyway, and language-directed editors have many benefits besides preventing misuse of reserved words; so any language is helped by them. Just because PL/I needs them less doesn't mean that it can do without them, either. Being made to use an editor isn't a bug; it's a feature.

Avoidance of reserved words substantially complicates compiler design and reduces their efficiency. (See Barrett and Couches' Compiler Construction, *pp. 128-131.) This in turn makes it less likely for the language to be implemented on a timely basis or on machines from smaller companies. A would-be "common" language should avoid these defects.*

PL/I's avoidance of reserved words has shifted the "gotcha" phenomenon to another area: parentheses around operands. Fortran requires periods around its logical and relational operators.

It seems to me that Report Writer hasn't been dramatically enough better than standard third-generation Cobol coding for report production for it to have broken through people's normal inertia. Don't you think that if it were two or three times better than it is now that it would be universally used?

Conner: My experience has been that Report Writer *has* been dramatically better than standard third-generation Cobol coding for report production. The measures I've used to judge Report Writer "better" are length and complexity of the Procedure Division and productivity both during development and during "maintenance."

If Report Writer were two or three times "better" than now, I doubt if it could overcome inertia. As it is, I view it as many times "better" than non-Report Writer report production, but the inertia persists. I, of course, would welcome a two- or threefold improvement in any product.

Knights: A new language or approach (and Report Writer is a sort of mini-language) requires a very dramatic payoff to overcome inertia — more like a factor of 10 better than a factor of two better.

Although you (and others) have mentioned "creation by committee" as a defect, "maintenance by committee" is, I think, Cobol's most important aspect, because it gives Cobol the ability to grow and flow with the times. For example, it can add nonprocedural facilities. Compare PL/I, where this sort of enhancement is unlikely. And compare Pascal, where there are numerous incompatible extensions and where the creator's shift to Modula-2 leaves current users a bit "in the lurch." These things explain why businesses have always felt safer with Cobol, and rightly so, despite the recent Chicken Little-ism we've observed. Don't you think Cobol will keep on truckin' and will ultimately pass the out-of-gas sports car languages that got a head start on it?

Conner: The question is argumentative, as are some others. Not having observed the various Cobol committees in action, I'm unqualified to answer the question as it relates specifically to Cobol.

First, it is a non sequitur to say that Cobol can grow and flow with the times because it's maintained by committee. It can be argued, indeed, that maintenance by committee

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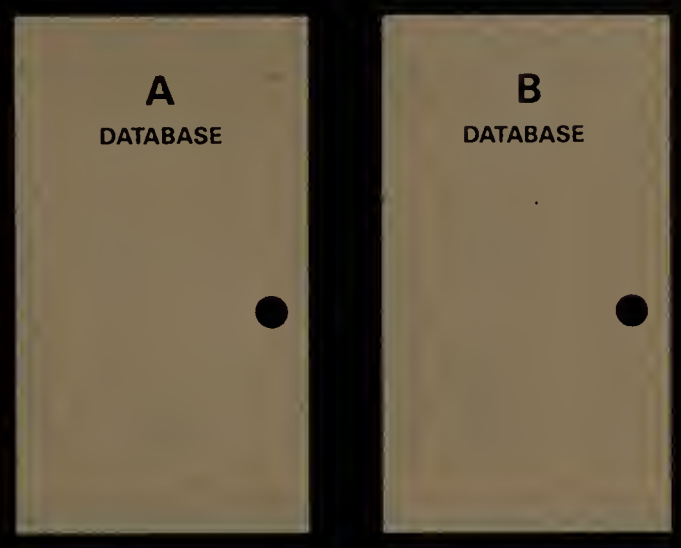
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impedes growth and flow (witness 1980 Cobol becoming 198x Cobol largely because its [re]definition is up to a committee).

Second, there are committees and committees. Much depends on their composition and leadership and the extent to which their members share values and interests. The first Cobol committee had serious divisions — even factions. I feel that the current committees may also have them. It was a committee that wrote the Constitution. It was also a committee that condemned Socrates to death.

Knights: "Argumentative questions": Their intent (successful) was to draw you out, to provoke spirited replies, not to suppress you. I see nothing objectionable about them. They weren't disrespectful.

A language without an ongoing body dedicated as strongly as Codasyl to its maintenance is less likely to be maintained and kept uniform. PL/I has not been enhanced. APL has recently been enhanced in three different directions — by IBM, Sharp and STSC (Scientific Time-Sharing Corp.). The delay in Cobol-8x is due to resistance by managers and would have been even worse if maintenance had been in the hands of a less representative body. I grant the second point: Maintenance by committee is certainly not a sufficient condition for growth; it's just a necessary one, usually. If fans of other languages wish to penetrate the business world, they should form a strong, dedicated committee to maintain it — business requires this reassurance. (Committees could "meet" inexpensively over a computer conference network.)

Maybe Cobol is shaping up because of the features you mention. If so, it only confirms my view that Cobol has been a weak reed.

Do you see the features in Cobol-8x and Codasyl Cobol [see ID/28] as evidence that Cobol is "shaping up"? If so, would you qualify your wish for it to, so to speak, "ship out"? That is, is your objection mainly to its skinniness (lack of features) or to the very shape of its skeleton?

Conner: Maybe Cobol is shaping up because of the features you mention. If so, it only confirms my view that Cobol has been a weak reed. If it were a good language to start with, it wouldn't need all the shaping up that has occurred and has been proposed. As I review Jerry Garfunkel's article [CW, June 11], for example, I get the feeling that people are trying to incorporate many Pascal and PL/I features into Cobol. Why bother? Those languages exist. If people prefer a wordy PL/I, I guess I don't object to their taste. I object to other things. I object to the redundancy of effort and the maintenance consequences. I object to the gyrations necessary to fit new features into a language whose fundamental design is not accommodating of new features.

Yes, the very shape of the skeleton is faulty. Attempts to flesh out the structure with new features while maintaining compatibility with all those Cobol programs that still are being "maintained" can only result in increasingly bizarre-looking programs.

Finally, one of Cobol's biggest weaknesses is its dependency on the English language — a dependency far greater than that of Pascal, Algol, APL or PL/I. What about the non-English-speaking world? For much of it, English is at best a second language, in which fluency on a level of that in the native tongue can't reasonably be expected. In Brazil, I taught programmers to write in PL/I rather than Cobol not only because I thought they'd be more productive, but because I had to teach them much less English. It is, I

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On the other hand, perhaps fourth-generation Cobol will share PL/I's fate; it will come too late, and most conversions from the third generation will have been to some other product. It would be poetic (in)justice for Cobol to suffer unexamined neglect, after all these years of unexamined dominance.

believe, presumptuous and chauvinistic to assume that English should be a *lingua franca* among programmers. If it is destined to become one, it will despite Cobol or anything else.

The difficulties outside the English-speaking world are nontrivial. To a Spaniard, for example, "THROUGH" and "THRU" are different words. So it's another little irritation to tell him they're the same and get him to believe it despite the fact that his English teacher has probably told him that "thru" is bad English.

Transliteration, too, can present problems. I suspect that the syntactical looseness of Cobol — or perhaps its great dependency on semantics — would inhibit creation of Cobol compilers in languages other than English. There has been no such inhibition with Fortran (for which at least a French version exists), APL (in which the problem is nonexistent) and PL/I (whose precompilation facilities make it a snap).

But imagine the effort involved in putting together, say, a French Cobol compiler. To take just one example, *de*, *du*, *d'*, *de la*, *de l'* and *des* might all have to be reserved; they all can translate into the English "of." If "official" Cobol is used in Germany, it must be amusing to read the Cobol programs written there.

One great advantage of PL/I, APL, Pascal and the like as international programming languages is that their vocabularies are largely borrowed from mathematics, which *is* a *lingua franca*. Most operators and delimiters are either familiar symbols or ones with enough individuality to distinguish them clearly from the vocabulary of the spoken and written language.

To respond to the "international" argument by saying that most programmers are competent in English is to beg the question, as well as to confuse "ought" with "is."

Knights: In your article, you complained that Cobol had not adopted features found in other languages — now you complain when you hear that it is adopting them! I suspect your attitude toward Cobol is "the better, the worse," since shops will be less likely to abandon a stronger Cobol for less irregular languages, such as PL/I. But that sort of conversion is not going to happen; in fact, the conversion trend in the U.S. is in the opposite direction.

The bottom-line, business-oriented difference between third-generation languages isn't great enough. Therefore, effective improvements in third-generation business programming languages will have to be meliorative, not radical. That means improving Cobol.

Cobol's awkward skeleton isn't a decisive argument against it. IBM's JCL and internal architecture are awkward compared with those of Burroughs, but a shop can have reasons to choose an IBM anyway — especially if it is using an IBM already.

Consider these recent words of Bruce Rosenblatt, a member of the original "3 by 3" PL/I committee: "Finally, I guess I must admit that one thing has become clearer to me, and I think to the rest of the programming community, and that's that programming languages per se are not the end-all of programmer productivity." The more important thing is program design skills, as Mr. Conner said at the end of his original article, ("Even Cobol's idiosyncrasies present only irritations, not real obstacles").

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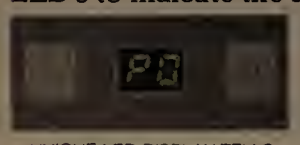
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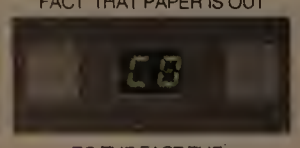
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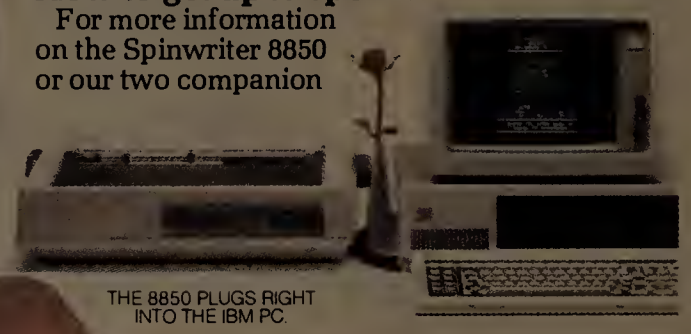
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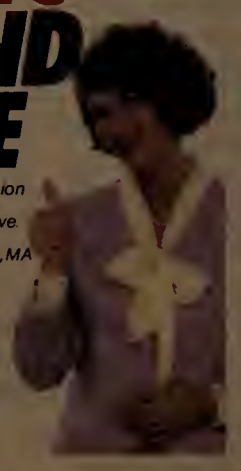


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N. Wirth had similar things to say in the August issue of Byte. *With this in mind, and with the removal of many of current Cobol's objectionable points in Cobol-8x, I hope that the style of future Cobol criticism will be more moderate, up-to-date and light-a-candle oriented.*

Programs written in Cobol-8x won't really be "bizarre"; Fortran-77 maintained compatibility with Fortran IV without doing itself harm, although it added new control structures. To combat stylistic mixtures, there should be a Standards Section, where sites *could prohibit or require certain statements, options and so on.*

Cobol's reliance on English was an attempt to do three things: to force programmers to document their programs, to make the language easy to learn and to make it more comprehensible to high-level personnel, including systems analysts. It was deliberately not programmer-oriented, deliberately not called Copol. *Most criticism of the committee and of Cobol misses those points.*

It has had some success in meeting those goals, which certainly are worthy ones. A Cobol with strong, vertical decision tables would meet those goals almost perfectly and be almost perfectly programmer-oriented, too. To put them over, a second "Conference in the Pentagon" might be needed, though.

Cobol's English-language dependency is not as objectionable abroad as one would think, from what I've heard. German programmers apparently like the fact that the reserved words are all in a foreign language, and thus they stand out in a listing and are unlikely to be unintentionally used. Russian programmers who were eventually offered a Russian-language Cobol refused to use it.

Only the French use a French-language Cobol, because French law requires it. (I don't know how they've made it "read" sensibly — it does seem difficult to do.) Precompilation is implementor-dependent in PL/I (it's not in the Ansi standard). Some Cobol implementations have similar power (for instance, Metacobol).

I don't think that the shape of a language's skeleton (its style) should be weighted as heavily over its muscularity (its features) as many writers do, especially academics.

Muscular (especially nonprocedural) features can make up for a lot. ("As the software industry matures, the past emphasis on general methods for building almost anything will be seen as a sign of immaturity, and a new concept of standard, optimized blueprints for common applications will start to appear." — T. Capers Jones.)

Applying reusable methods on top of Cobol, as Raytheon Co., for instance, has done, offers a more dramatic improvement and fewer costs than migrating to another language.

Anyway, the Cobol language itself is in the process of providing such special-purpose blueprints. VALIDATE is a truly gorgeous one, for automatically validating input data, no matter how complex the requirements, and for producing error messages.

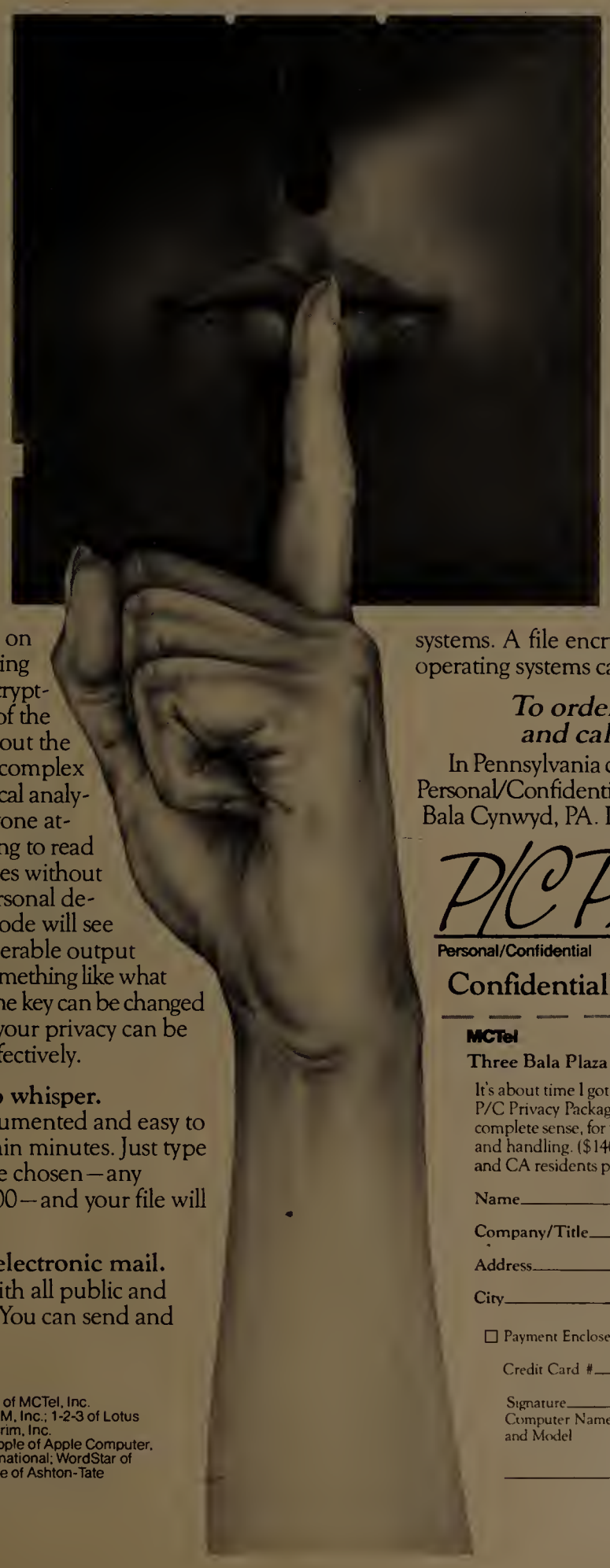
When it is added, the bullies on the beach won't kick sand in Cobol's face again! (Of course, your suggested macro facility would be a help in constructing such blueprints.)

On the other hand, perhaps fourth-generation Cobol will share PL/I's fate; it will come too late, and most conversions from the third generation will have been to some other product. It would be poetic (in)justice for Cobol to suffer unexamined neglect, after all these years of unexamined dominance. But then again, by year-end there will be four or five 8x compilers out, which may save the day.

It would be interesting to read the impressions of Control Data Corp. and Digital Equipment Corp. programmers on how much happier they are with the Cobol-8x compilers they have had available.

Cobol is "English-like" in more than one way: in its traditional rather than theoretical base, in its democratic, compromise-influenced development, in its quaint nooks and crannies. I think it will muddle through despite everything. Cobol (-74) is dead — long live Cobol (8x)!

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A list of Codasyl Cobol features

The features or language changes listed here are in the latest version of the Conference on Data Systems Languages (Codasyl) Cobol Committee Journal of Development, but are not in the American National Standards Institute's (Ansi) 198x Cobol standard.

Most of the features or language changes were added after the 1978 JOD (the 198x base document) was published. The majority of the features or changes listed here are upward-compatible, with the exception of some reserved words. The major features are:

1. The data base facility, which allows the user a great deal of flexibility, power, protection and concurrency. Ansi is developing a data base facility as a separate standard; it may or may not resemble the Codasyl facility.

2. Boolean data items, literals, operators (B-AND, B-EXOR, B-LESS, B-OR, CONTAINS and IS CONTAINED IN) expressions and a class test. Also included: USAGE IS BIT for compressing boolean items.

3. Floating-point data representation, floating-point literals and edit pictures.

4. Three types of standard intermediate data items for arithmetic expressions, function returns and parameter passing. This feature makes all implementations return the same results. A default option allows implementor-defined or standard arithmetic results, for complete compatibility.

5. Passing of arithmetic expressions and literals by content in a CALL.

6. The DELETE FILE statement. Returns a file to the system.

7. The ability to change dynamically the program collating sequence.

8. Vertical advancing (via WRITE ADVANCING) in a negative direction. In addition, control of overprinting with WRITE ADVANCING (via RETAINING) is provided.

9. Subscripting with arithmetic expressions. 198x Cobol allows only a data-name + or - a literal.

10. Index data items in the FROM phrase of a PERFORM statement.

11. EXIT PERFORM. This will cause a jump out of an in-line PERFORM or a jump to the test of the PERFORM.

12. A COLUMN PLUS clause in Report Writer, analogous to LINE PLUS.

13. A PRESENT WHEN clause in Report Writer. This enables conditional presentation of lines or fields on a line.

14. Free-format source code. The continuation of nonnumeric literals was changed to remove the hyphen from the indicator area and add a continuation mark ("-) on the line being continued.

Although this is not compatible, we are working on an option to specify the old method new method in the first line of the source program.

15. Literals are allowed in the FROM phrase in the WRITE and SEND statements. For example, to write blank lines: WRITE . . . FROM SPACES.

16. Intrinsic (built-in) functions. There are currently more than 30 such functions. Functions do not require new reserved words.

17. Setting individual elements in a table to different values with a VALUE clause.

18. Removal of the requirement for paragraph-names after a section-name or at the start of the program.

19. The REDEFINES clause can now be specified in any order in a Record Description entry.

20. SET condition-name TO FALSE and a FALSE value on an 88.

21. The validation facility allows the validation of records or data items based on criteria specified in their Data Description entries.

22. In-line comments. Any text following "*>" until the end of line is considered to be comments.

23. STOP RUN WITH (ERROR) STATUS (identifier / literal). This allows the program to cause abnormal termination and/or return information to the operating system.

24. 60-character Cobol names. It was felt that 30 characters were not long enough and unlimited (as in Ada) was not reasonable.

25. Comma and currency sign allowed in numeric literals. For example, $123,456 is now legal.

26. INITIALIZE TO VALUE. Items with VALUE clauses can be initialized to their VALUE clause.

Some areas currently being worked on are:

1. A common exception handling facility. It will allow checking of errors which are now undetected (subscript range, size error when SIZE ERROR is not specified, loss of sign and so on), combine all exception handling into one facility (keeping the old for compatibility) and provide in-line as well as declarative processing for all exceptions.

2. A screen management facility.

3. An update and analyze facility.

4. User-defined functions.

5. File and record locking. This will allow concurrent access to files by multiple run units.

6. A table sorting facility. this will extend the SORT statement to allow sorting of regular tables.

7. Runtime centering and right-alignment, within a receiving field, of the nonblank portion of the sending field.

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An interview: Cobol defender

I never expect criticism of Cobol to diminish. Lots and lots of computer science graduates are being churned out every day, and nearly every one of those graduates has had "hate Cobol" drilled into him.

Cobol-74 is based on the 1971 Journal of Development (JOD). Criticism of Cobol must seem 13 years out of date to you.

Nelson: Sometimes it does. However, I have been writing and supporting Cobol compilers and writing Cobol programs for 20 years, so I certainly can identify with the criticisms.

Cobol-8x is based on the 1978 JOD, although some features added to subsequent JODs have been included. What are the chances of accelerating the standardization process, as propsed by Jerry Garfunkel [CW, June 26]? Do you support the idea?

Nelson: I think the chances of accelerating the standardization process are nil. There are too many vocal people who want no change at all to Cobol. Also, how would the compilers be validated? There would be lots of standards in place at the same time as well. I like the idea basically, but some important questions have to be answered. So far, all I have heard are generalizations.

How damaging to Cobol has been the delay in approval of Cobol-8X? I've heard that some shops have ceased new work on Cobol in the past few years. Might that not have happened if new features had been added on an ongoing basis, as proposed by Jerry?

Nelson: The delay in approval has been extremely damaging. I doubt that the new feature proposal would have had any influence on the shops' dropping Cobol.

How can readers follow Cobol development work?

Nelson: Readers can follow development with the JOD and change page service.

Is there a need for volunteers for any Codasyl task groups or committees? How can organizations apply to participate in Codasyl activities? Can trade groups and other associations be committee members, to spread expenses of participants and be more representative? Is there any possibility of involving academia in the work in any area?

Nelson: All of the Codasyl groups need volunteers. They can write to Codasyl (Codasyl, c/o Cbema, 311 First St., Washington, D.C. 20001). They will receive a list of the committees and the addresses of their chairmen.

I've often thought a monthly "Cobol Corner" column, containing Cobol news, tips and controversy, would be a good reader service. Would you or other committee members be willing to make occasional contributions?

Nelson: I would contribute to a Cobol corner. I could submit a bimonthly report on the activities that took place at the last Codasyl Cobol Committee meeting.

There is frequent criticism of Cobol in articles in the DP press, especially those written by vendors offering competing proprietary languages. Do you think this has been one-sided? What do you think of their claims to offer x times the productivity of Cobol?

Nelson: Obviously the criticism is one-sided. Anyone can see that. For certain applications, the "x times" factors are probably close, but for others they are not close at all. Third-generation languages are fine and should be used for many of the applications Cobol has been used for. However, some applications do not lend themselves to this approach.

How much of an improvement in productivity do you estimate Cobol-8x provides? Will a similar improvement be possible in Cobol-9x, assuming that about 60% of its features have been approved to date?

Nelson: I have heard estimates of 50% or more in development time and more than that in reduction of maintenance expenses. I have noticed similar improvements in my own use of Cobol-8x. Cobol-9x won't have such a dramatic improvement.

Do you expect criticism of Cobol to diminish as vendors (for example, Control Data Corp., Digital Equipment Corp. and IBM) enhance their compilers and the new features gradually become available? Or is Cobol-baiting too ingrained?

Nelson: I never expect criticism of Cobol to diminish. Lots of computer science graduates are being churned out every day, and nearly all have had "hate Cobol" drilled into them.

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I seem to have read somewhere that the long-range committee was to have worked on an automatic programming language (a fourth-generation language). Can you confirm that?

Nelson: I don't have the faintest idea. I wasn't a part of that group. However, the Codasyl organization is now looking into that area.

What languages do you know? How much have you programmed in them, relative to Cobol? How much of your recent Cobol programming has been in versions enhanced with 8x features?

Nelson: I know about 20 or so. Most are languages used by implementors for writing software. Some are assemblers, and the compilers all tend to be like Algol or Pascal. I have also written extensively in Ada. I have programmed much more in languages other than Cobol, since my main job is writing compilers (I wouldn't use Cobol for that, even though Micro Focus did). Most of my recent Cobol programming has been in enhanced Cobol (with 8x features).

Do you consider Cobol superior for business use? How much? Why? What are specific defects in style and substance in other languages?

Nelson: I consider it superior to other procedural languages for many business applications. It depends on the application. If the application fits, it is easier to use, has more support facilities than nearly any other language (interactive debuggers, special editors and so on), produces more readable programs that are easier to maintain and extend and so on.

What are Cobol's defects (in style and substance) relative to other languages, based on your experience? Do you think these are crippling or merely cosmetic?

Nelson: There is no way to generalize about Cobol vs. other languages since there are thousands of other languages, and each has its own merits and demerits. Most of the defects pointed out by the detractors have been resolved in Cobol-8x. It is a bit wordy (on purpose), somewhat difficult to learn (but easier than PL/I or Ada) and lacks some worthwhile features. Most of the defects are cosmetic.

What features would you like to see added to Cobol that the committee has rejected?

Nelson: Asynchronous processing is the big one.

Any comments on decision tables?

Nelson: Not everybody loves them. They have fallen out of favor in recent years.

Knights: They may be rising again. A November 1983 Byte article began: "Decision tables — a systems analysis technique that has come and gone and come back again . . ." The 1982 Codasyl report on the subject should make decision tables more interesting to both implementors and users. For implementors, it provides "a theoretical foundation for decision tables based on set theory and modern algebra [which] is a significant departure from the conventional definitional approach to decision tables, and [which] contains several novel results." For users, it allows the following powerful features: "multihit" tables, an iteration construct and intermixed actions and conditions.

Conner's criticism of INSPECT, STRING and UNSTRING for being difficult to understand from the vendors' documentation can be applied to many other features of the language (most notably Report Writer). Would you welcome volunteers (academics, perhaps?) to produce a semi-official "Cobol Commentary" document paralleling the official specifications, containing programmer's notes, examples and supplementary "descriptive" (as opposed to "definitive") treatment of the clauses, statements and so forth? The vendors' manuals don't give enough assistance, and texts are incomplete and too often wrong.

Nelson: There are lots of books out that do just that. I can't see how a group of volunteers (especially

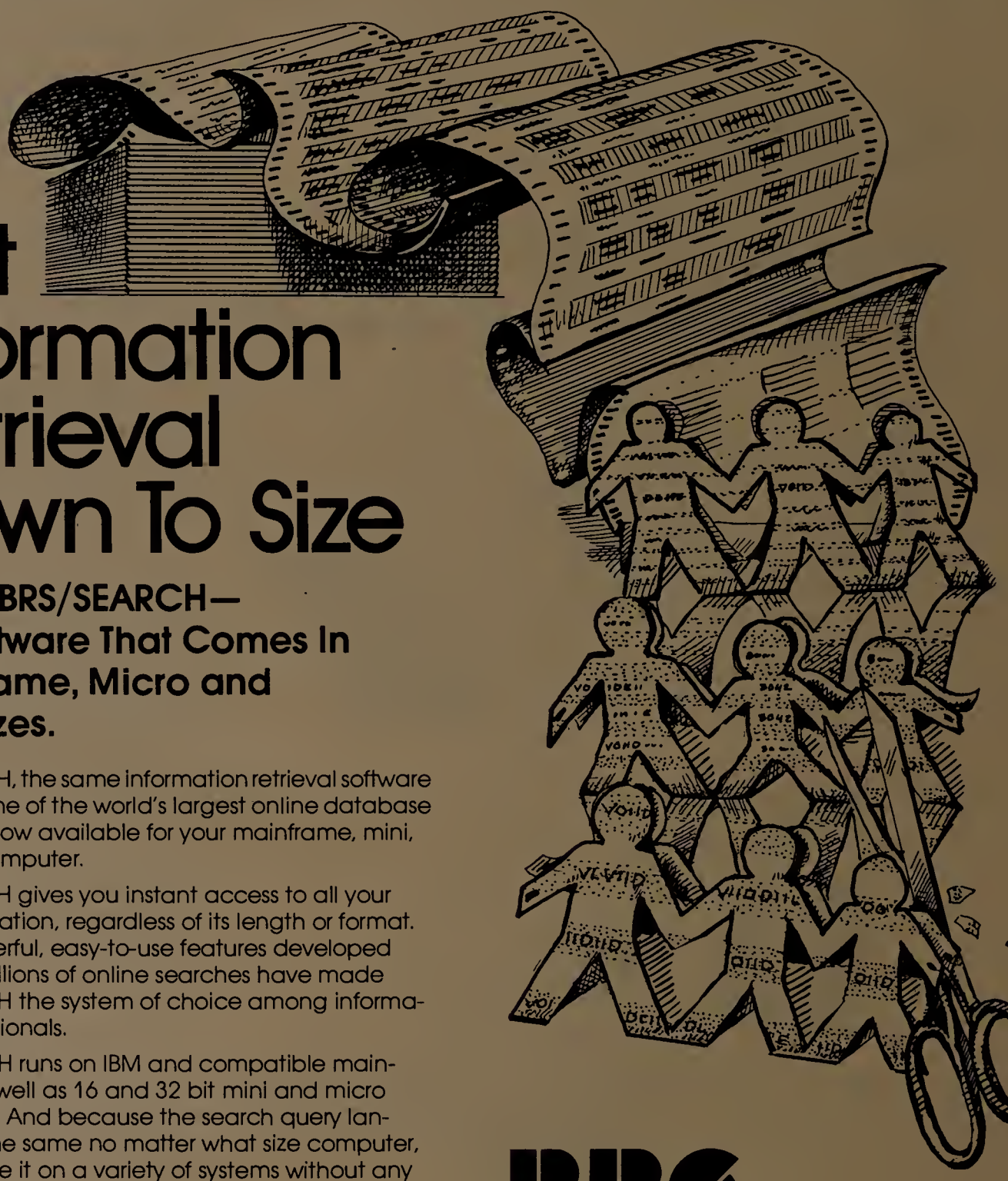
Contacts

To make suggestions to the Codasyl Cobol Committee, contact: Donald Nelson, Chairman, Codasyl/Cobol Committee, c/o Tandem Computers, Inc., 10555 Ridgeview Court, Cupertino, Calif. 95014.

To comment on the dpANS Cobol, contact: Chairman, X3J4 Cobol Committee, c/o X3 Secretariat, Cbema, 311 First St. N.W., Washington, D.C. 20001.

To request a Cobol Information Bulletin (CIB) or dpANS ($25) or the current Cobol Change Package ($20), send a self-addressed mailing label and prepayment to: Ansi X3 Secretariat, Cbema, 311 First St. N.W., Washington, D.C. 20001.

To order the *1984 Codasyl/Cobol Journal of Development* ($48), contact: Supply & Services Canada, Canadian Government Publishing Center, Hull, Quebec, Canada K1A 0S9. (Note: Check must be made out in Canadian funds to "Receiver General for Canada." To order by Visa or Mastercard, call information in 819 area code, Supply & Services Canada, to get the order desk for the Canadian Government Publishing Center.)



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with academics — who hate Cobol anyhow) would do any better than the myriad of authors who produce what is out there now.

Knights: There are no comprehensive books that parallel and comment on the standard. It's unlikely, unfortunately, that there will ever be one.

Originally, Cobol was criticized for its hasty development, which resulted in some poorly considered decisions. Now that Cobol's development is proceeding in a more deliberate fashion, it's being criticized for its slow development. It "don't get no respect" for the good side of whatever it does, which seems unfair. Nevertheless, speedier development and timely development of other facilities like screen management seem crucial to retaining its central place in DP. The limiting factor on such development at present is the expense of membership (including the disruption of time away from work). What do you think of the following ideas for obtaining more volunteers and more workdays:

a. Delegation of minor tasks (for example, editorial proposals) to subcommittees?

Nelson: We tried this and it didn't work. It resulted in more expenses for the subcommittee members. There is no way the members will accept proposals from anyone without debating them.

b. Involvement of academics (who might be able to get publication credit for their committee work)?

Nelson: We have had academic involvement in the past. However, the vast majority hate Cobol. Those who like it don't have the budgets to participate.

c. Involvement of retired persons sponsored by their former employers? (These people would have free time, but would still be able to represent concerns of the real world.)

Nelson: Fine. However, I doubt if you would find any company that would do this since most feel that one of the benefits of membership is to have in-house understanding of what is going on.

d. Quarterly, nine-day meetings (36 days per year) instead of bimonthly four-day meetings (24 days per year)? (Total travel/hotel expenses would remain about the same.)

Nelson: A nine-day meeting would never work. Four-day meetings tend to get ragged on the last day, and nine-day meetings would be even worse. You cannot sit there eight hours a day for that many days engaging in intense technical discussions without wearing out on the last day. Some feel that we should go back to three-day meetings.

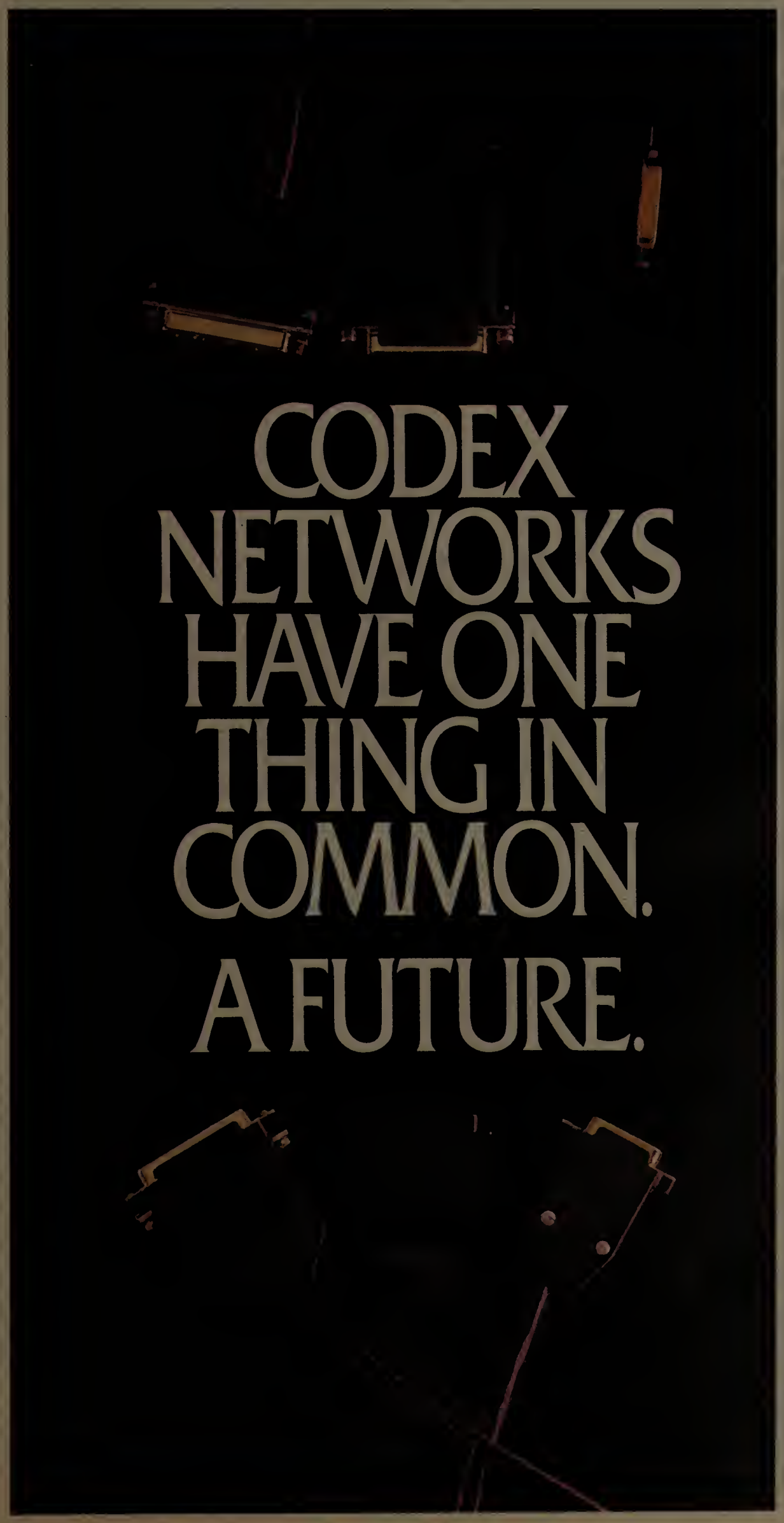
Knights: Perhaps a five-day meeting, broken by a weekend, would be bearable. It might even be easier.

e. Computer conferencing or videoconferencing to supplement or partially replace meetings?

Nelson: Who is going to pay for that stuff? It can be more expensive and less productive. Videoconferencing has been used by some of my employers and was promptly abandoned as useless.

f. Financial support by government? By industry? By user sites (a tax of 1 mill per compile, perhaps)? By softhearted software houses that could offer a

Cobol "don't get no respect" for the good side of whatever it does, which seems unfair. Nevertheless, speedier development and timely development of other facilities like screen management seem crucial to retaining its central place in DP.



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50% discount on their products to Codasyl participants?

Nelson: Financial support would certainly help, but none has ever been forthcoming. This is true for IEEE, Ansi, Codasyl and everyone else. Expecting any would be unrealistic — especially a tax or the discount method. There is no such thing as a softhearted profit-making concern of any kind. Basically, "there ain't no such thing as a free lunch."

Knights: For what it's worth, I'd offer such a discount. And other software sellers and training firms might, too, if they could display an "I'm-a-good-guy" seal in their ads, like the Olympics sponsors.

What do you think of Codasyl's having a "polling group" of a dozen commercial users to give feedback on proposed changes? Their comments could help avoid putting in objectionable changes that delay the standard and could also help to pass large enhancements that could otherwise be delayed or cut down.

Nelson: Well, we do have 10 user organizations, including government organizations, on our committee — theoretically, they should be doing that sort of thing.

I have no idea how you would form such a panel. I have no idea how they'd ever know what we're doing, unless we sent some kind of synopsis to them before we worked on the proposals. If they're really concerned, some group like Share or Guide [IBM user groups], which represents lots of users, could certainly join the committee and give us its opinion. Any user group can join. Anyone can join — any person can say, "I'm an organization," and join.

As for keeping the polling group in touch, perhaps even after-the-fact information, such as trip reports from Britain's National Computing Center or committee minutes, would be of some help. Major proposals aren't usually disposed of at a single meeting, and the preview they'd get of the agenda could give them some early warning.

Nelson: If they want something official, they could use the letter that I send to X3J4, which details everything we've done at each minute. X3J4 is completely informed at all times of everything we are doing. X3J4 has commercial users on it — and none of them ever says anything. The fact is, users don't seem to want to do anything until it gets down to the wire; then they seem to like to poke a stick in the wheels.

Well, my hope is that statements like this will sting organizations that otherwise lack the nerve to get involved to do so.

About the participants

Richard L. Conner is a San Francisco-based consultant specializing in software and management consulting. He has extensive DP experience in the U.S. and abroad, including nine years with IBM. He wrote "Cobol, your age is showing" in the May 14 issue of Computerworld.

Donald F. Nelson has been in data processing for 30 years and has developed CDC's Cobol compilers. He works as a software designer at Tandem Computers, Inc. and chairs the Codasyl Cobol Committee.

Roger Knights has made suggestions accepted by the Cobol Committee. He is a Seattle, Wash.-based distributor of a superset Report Writer precompiler.

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IN DEPTH

Before a key worker leaves . . .

By Robert S. Arnold

This article shows how to measure the possible impact of any employee's leaving the department. You will see how to project a turnover profile for each person and learn to judge when a turnover profile indicates the potential of a dangerous backlog.

We've all heard of captive managers kowtowing to the last, all-knowing maintainer of an old but critical software system. Losing this person would be disastrous to the company, so the manager grits his teeth, and an ulcer festers.

You may need to fire an employee. Others take leaves of absence, seek transfers or new jobs. It is surprising that so few managers plan what they would do should any given person suddenly leave the workplace.

Personnel turnover continues to be a sore spot in data processing department budgets. According to a recent University of Maryland study, turnover of personnel on some data processing projects was as high as 30%. In an informal survey, Stanley Acker, a human resource consultant, estimated the cost of recruiting, relocating and training a newly hired person to be as much as $10,000. These figures mean that if your DP shop employs 20 people, you could be losing as much as $60,000 per project just to turnover overhead. And that cost doesn't count lost productivity.

For years, managers have concentrated on stopping turnover before it starts. Incentives include higher salaries, private offices, understanding and accommodating workers' goals and promoting positive workplace attitudes. These efforts do save turnover dollars, but there is still room for improvement. With the increased costs of recruitment, training and salaries, the need to avoid turnover is greater than ever.

Freedom from the

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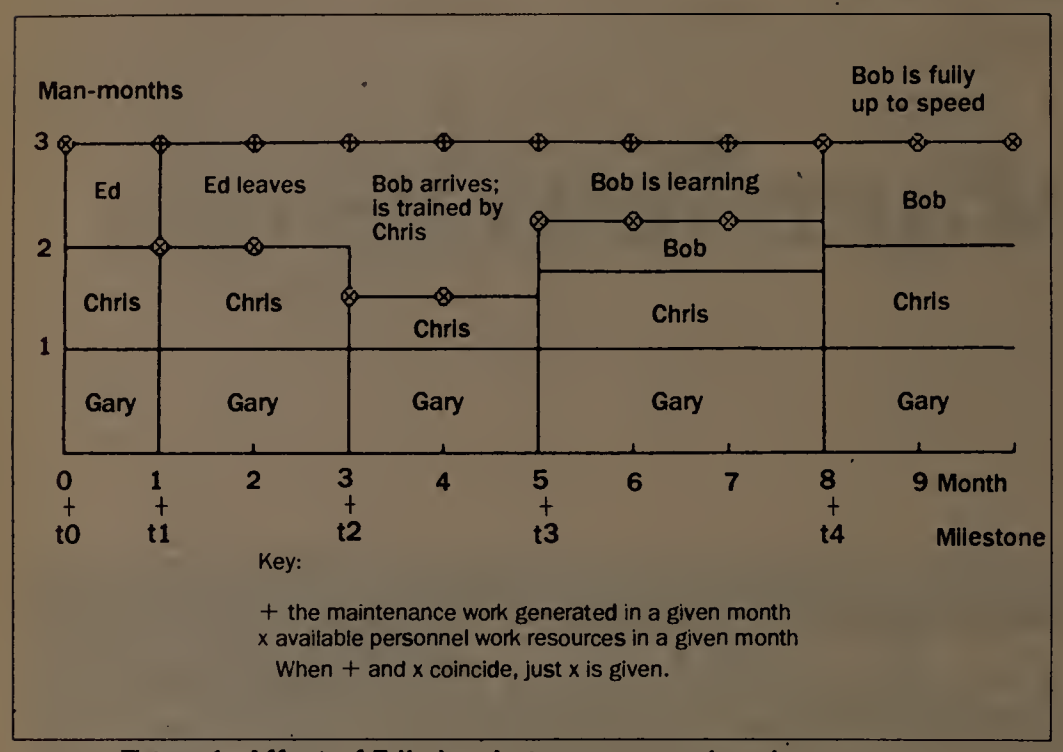


Figure 1. Affect of Ed's leaving on personnel work resources

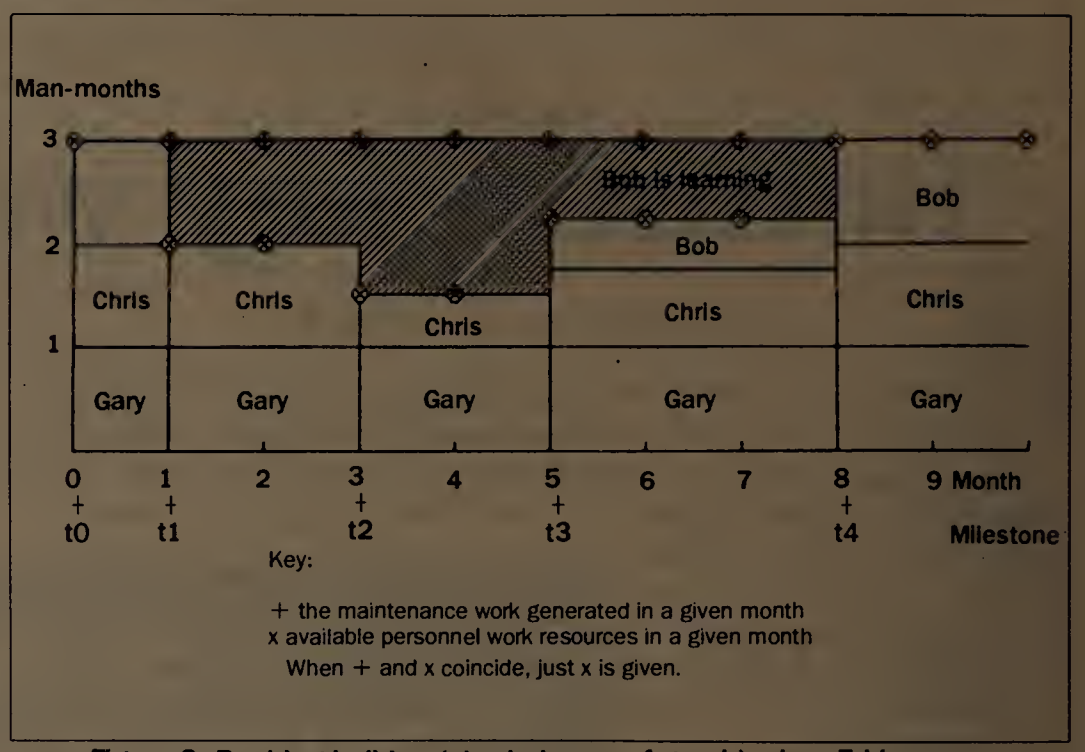


Figure 2. Backlog buildup (shaded area of graph) when Ed leaves

effects of turnover comes from planning for it. Until now, few tools or models have been available to help managers plan for turnover. Managers typically take a seat-of-the-pants approach: deal with turnover whenever it happens, not before. Given that turnover costs money and managers are under increasing pressure to get the most out of their DP dollar, some quantitative tools for turnover contingency planning are long overdue.

This article will give you some quantitative tools for turnover planning. You will see how to project a turnover profile for each person in your department, when a turnover profile shows a potentially dangerous backlog for the organization, how a turnover contingency plan can be formed to remedy this and how the plan can be justified to upper management.

The principles involved in turnover contingency planning are presented via a detailed, realistic example of turnover in a software maintenance shop. The example is based on published descriptions of software maintenance shops and on descriptions of the actual turnover process. All characters in the example are fictitious. The text of the example is in regular type. Comments are in italic and are addressed to the reader.

Contingency planning

Imagine yourself in this situation. John manages a Cobol shop of three maintenance programmers: Gary, Chris and Ed. The three programmers have had work up to their ears the past few months and are beginning to ask when it will let up. You, as John, know they have done a terrific job, but you are afraid to tell them that three big, new Cobol systems have just been assigned to their section for maintenance.

Ed has been grumbling lately about the high work load. In fact, he's hinted he might transfer. Through the grapevine, you know Ed isn't bluffing. If something isn't done fast, he may become another turnover statistic.

If you have any hopes of retaining Ed as a worker, now is the time to act. Try to talk with Ed about the problem or get a third party involved. Be careful not to make Ed feel that someone is "spying" on him or he might totally distrust you. If talking to Ed makes you think the situation is hopeless, read on.

Since everyone is important in your shop, you get a sinking feeling in your stomach. If Ed leaves, what will happen to your glut of maintenance work? More important, what is that going to do to your life? The last time this happened you worked overtime for two months. Your wife threatened to walk out.

Since Ed has not yet left, you still have time to plan should he leave. Don't give way to despair. User good will and corporate reputation are potentially at stake.

Start planning

Let's chart the situation. From experience and limited record keeping, we know Gary, Chris and Ed all work at the average rate of one man-month/month (1 mm/mo). For our purposes, 1 mm/mo of work means a worker can actually perform in one work-month work that is estimated to take usually one work-month to perform. We also know work has been arriving steadily at an average rate of 3 mm/mo.

This definition assumes you have data for making these estimates. Where will the data come from? You should have at least the following recorded for each change request: when the request was made, an estimate of the programmer time needed to complete the request, which programmer(s) were assigned to complete the request, when the request was completed and the actual programmer time needed to complete the request.

Concerning the rate at which work arrives, look at the change requests finished in previous months. The programmer time spent on these requests can then be chalked up to the months when the requests were originally made. Looking at the work generated in these original months can give you an historical basis for estimating the current work generated per month. Of course, if current work estimates are much higher or lower than "normal," your estimates may have to be revised accordingly.

Concerning the productivity rates for the maintainers, comparing their actual work times with the work estimates for completed changes to which they were assigned can help. Your intuition on the programmers may also be helpful, but be conservative. If in doubt, assign a programmer less productivity. After all, the estimates are used in turnover contingency planning only, not for programmer evaluation.

Figure 1 shows Ed's turnover profile — the effect of Ed's leaving on personnel work resources. In starting our turnover contingency planning, we are currently at the beginning of month t_0. At the start of month t_1, Ed leaves. At the beginning of month t_2, Bob starts and is trained by Chris. Initially, Bob is not productive and ½ mm/mo (for example) of Chris' time is spent training Bob. At the beginning of month t_3, Bob is starting to get productive (½ mm/mo), and less of Chris's time (¼ mm/mo) is needed to train Bob. At the start of month t_4, Bob is fully up to speed (1 mm/mo).

The data on times to locate, hire, train and mature a replacement person is specific to this example and may not hold in your environment. However, this information should not be hard to obtain for your group. The data on time to locate and hire a suitable person (period t_1 to t_2) could come from personnel department files. The data on new hire learning curves and time required by seasoned staff to do the training (periods t_2 to t_3, t_3 to t_4) could come from your experience and the experience of your programmers.

Some published numbers are available. For example, R. McLaughlin in 1979 estimated the period t_0 to t_1, the time between a turnover, to

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be 18 months; the period t_1 to t_2, the time to locate a new person, to be six to seven months; and the period t_2 to t_4, the time to train the new hire and get him fully up to speed, to be eight to 12 months.

If you've got more accurate local numbers, use them.

One point worth checking in your shop is Chris's knowledge of Ed's job and her ability to train Bob to do Ed's job. This is a major assumption about Chris, since typically maintenance programmers have their hands full with their own jobs, much less knowing somebody else's job and having the ability to train quickly a new hire in it. As we will see below, having people with backup knowledge for every job in your DP shop is important for implementation of the turnover contingency plan.

Some simple mathematics will tell us a lot about this situation. First question: Is the work capacity sufficient to handle the current monthly work at t_0? Yes, since the work capacity is 1 mm/mo (for Ed) + 1 mm/mo (for Chris) + 1 mm/mo (for Gary) = 3 mm/mo, which is equal to the monthly generated work load, 3 mm/mo. If Ed leaves at month t_1, can we still handle the monthly work? No, since the work capacity is 0 mm/mo (for Ed) + 1 mm/mo (for Chris) + 1 mm/mo (for Gary) = 2 mm/mo, which is less than the monthly generated workload, 3 mm/mo.

This example does not view overtime work as a planning option. Realistically, some overtime work is occasionally necessary, but this should be regarded as a short-term safety valve (one to two weeks at most) and not be included in the turnover contingency planning. If overtime work is regarded as an option, in the worst case everyone will have at least seven months of overtime — the period from when Ed leaves (t_1) until Bob is fully up to speed (t_4). A turnover contingency plan should not be designed to encourage more turnover.

So if Ed leaves, we can't handle the situation. That is, backlog will build. Is this really anything to be alarmed about? After all, we've lived with backlog in the past.

How important is the work in that backlog? If all the work is critical (it needs to be done fast) we've got serious problems. The backlog will build a long time before we can get anyone to take Ed's place. Let's see what the backlog would be here and, more important, what kind of eventual delays to critical work are involved.

Definitions of critical work will vary from shop to shop. Looking at urgency is just one dimension. Other factors could be importance of the work to the corporation, importance of the work to the user, cost incentives in performing work early for a customer and others.

Since the work generated exceeds the available personnel resources when Ed leaves at t_2, the backlog created is simply the difference between the generated work and the available work capacity. This backlog is the shaded part of Figure 2.

By the time Bob is fully up to speed at t_4, the critical-work backlog will be: 2 mm (for the period from t_1 to t_2) + 3 mm (for the period from t_2 to t_3) + 2.25 mm (for the period from t_3 to t_4) = 7.25 mm. *If there was no other maintenance work arriving at or after t_4*, the time to clear this backlog would be at least:

Typically, maintenance programmers have their hands full with their own jobs. However, having people with backup knowledge for every job in the shop is important for implementing the turnover contingency plan.

(accumulated backlog up to the beginning of month t_4)/(available work capacity at t_4)
= 7.25 mm/(3 mm/mo)
= 2.4 calendar months

This means some critical work will be delayed by at least 2.4 months starting from the point when Bob finally gets up to speed. Not too good for critical work.

Slow response in delivering critical work may be interpreted by your users or customers as lack of ability to deliver — a sign of poor integrity. Can your department or corporation afford this image?

The situation is even worse if maintenance work continues to arrive at the same rate after Bob is fully up to speed (at t_4). Here the total work available will be:

(accumulated backlog up to the beginning of month t_4) +
(the work generated during month t_4)
= 7.25 mm + 3 mm
= 10.25 mm

So at the end of month t_4 we will still have the following backlog:

backlog at end of t_4 = (accumulated work at end of month t_4) - (work capacity during month t_4)
= 10.25 mm - 3 mm
= 7.25 mm

If the generated work stays the same in the rest of the months after t_4, then we'll have a *permanent* backlog of 7.25 mm, and all critical work will be delayed 2.4 calendar months on average.

But what if some maintenance work isn't critical? After all, we nearly always get some changes we can reasonably delay. Won't some noncritical work improve the backlog picture? Fortunately, yes, since we can temporarily forget about noncritical work and clear out just the

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critical work in our backlog. If .5 mm/mo of the 3 mm/mo work generated each month is noncritical, then the backlog situation is as shown in Figure 3.

In this more realistic situation, we'll have a less critical-work backlog when Bob is fully up to speed at t_4, but we'll still have some: 1 mm (for the period from t_1 to t_2) + 2 mm (from t_2 to t_3) + .75 mm (from t_3 to t_4 = 3.75 mm.

Even in this case, the backlog at t_4, combined with the steady arrival of work at 2.5 mm/mo, means that by the time Bob is fully up to speed at t_4, we will still need at least 7.5 months to clear the backlog of critical work. To see this, note that the time needed to clear backlog at t_4, assuming critical work continues to arrive at 2.5 mm/mo, is:

(backlog at t_4)/(excess work capacity for critical work *per month* from month t_4 and after)
=3.75 mm/[(maximum work capacity per month) -(generated critical work each month)]
=3.75 mm/[3 mm/mo-2.5 mm/mo]
=3.75 mm/(.5 mm/mo)
=7.5 months.

That's a bit long to make our users or customers wait for critical work to be completed.

Drawing up and analyzing turnover profiles for everyone in your shop will reveal those people whose replacement is most serious in terms of accumulated critical-work backlog. Plans should be made so that no critical-work backlog is projected, should anyone leave.

A natural question arises. If we want to keep our users from waiting for critical changes when Bob becomes fully productive, how low must critical work be before we can guarantee there is *no* backlog of critical work at t_4? Answer: 1.95 mm/mo.

To see this, notice that in Figure 4, we have moved the critical-work generation line so that the area of region B, the excess work capacity available to resolve backlog during the turnover cycle t_1 to t_4, equals the area of region A, the critical-work backlog generated during the turnover cycle.

As long as area A equals B, voila! No critical work backlog. In Figure 4, this happens when the critical work generated each month is 1.95 mm/mo, since:

area A = excess work generated from t_2 to t_3
= (no. months in the period t_2 to t_3)* excess work generated each month in the period t_2 to t_3)
= 2* (1.95 mm/mo - 1.5 mm/mo)
= 2* .45 mm/mo
= .9 mm/mo;
area B = excess work capacity during the period t_3 to t_4
= (no. months in the period t_3 to t_4)* excess work generated each month in the period t_3 to t_4)
= 3* (2.25 mm/mo - 1.95 mm/mo)
= 3* .3 mm/mo
= .9 mm/mo

If we can just reduce the critical work to 1.95 mm/mo during the turnover cycle, we won't have any critical-work backlog when Bob gets up to speed.

The area C in Figure 4 indicates excess work capacity available before backlog buildup. This doesn't help us here, since there is no backlog to work on from t_1 to t_2. In other examples, it is possible for area C to represent a backlog buildup itself.

But wait a minute. It looks like wishful thinking to say we don't need any slack time among our personnel for contingencies during the turnover cycle. After all, we may in fact get more critical work than we bargained for. Or Bob may take longer to be found. Shouldn't we plan for some slack effort to handle unforeseen problems?

Well, yes, to be safe. We can do this either by adding to our maintenance work capacity — something we can control — or reducing the amount of critical work, something harder to control. Adding to the maintenance work capacity means training more people or increasing the productivity of our current workers.

Some while back we purchased a configuration management tool for storing code versions and storing results of tests. We never used it because of deadline pressures, but let's try it now.

The configuration management tool is incidental to this example. You may very well have a different tool or a different way to change maintainer productivities.

Beware of hiring more maintainers. Every maintainer hired will need some training, and this training time means time neglected for clearing backlog. In other words, if you hire more maintainers, be prepared for a short-term backlog increase relative to not hiring maintainers.

Suppose that the productivities of Gary, Chris, Ed and Bob become 1.25 mm/mo, 1.25 mm/mo, .75 mm/mo and 1.5 mm/mo, respectively, when the tool is used regularly. (The decreased productivity from 1 mm/mo to .75 mm/mo for Ed means Ed is expected to have problems adjusting to the new tool, or he may be uncooperative prior to leaving. The increased productivity from 1 mm/mo to 1.5 mm/mo for Bob means Bob is expected to do well using the tool, perhaps from earlier experience.) Assuming again that all work generated (3 mm/mo) is critical, Figure 5 graphs the situation.



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IN DEPTH/BEFORE WORKER LEAVES

With increased productivity, the critical-work backlog after Bob comes up to speed is .5 mm (from t_1 to t_2) + 2 mm (from t_2 to t_3) = 2.5 mm. Since from t_4 on we have an extra work capacity of 1 mm/mo, this backlog can be cleared after 2.5 mm/(1 mm/mo) = 2.5 more months.

If Figure 5 had shown, relative to Figure 4, increased backlog as a result of using the tool, new solutions to the backlog problem would have to be sought.

The turnover situation with the configuration management tool is better, but more safety is needed. We may be hinging our plans too much on Bob's coming up to speed in a short time. Can't anyone in our environment fill in until Bob is trained and ready to go?

Only two months ago, Diane was rotated out of maintenance and into development. If Ed leaves, let's bring her back into maintenance until we get over the turnover crunch. Since she is already familiar with the maintenance environment, no time will be needed to train her. Let's also try to cut the critical work rate to 2.5 mm/mo and reintroduce the configuration management tool. Suppose Diane's productivity in this situation is 1.25 mm/mo. (See Figure 6 on ID/40.)

If you don't have an available maintainer requiring no training, you have lost an important way of covering yourself when turnover occurs. Start to develop backup people immediately for everyone whose sudden absence would seriously affect your environment. Keep in mind that someone will have to cover for

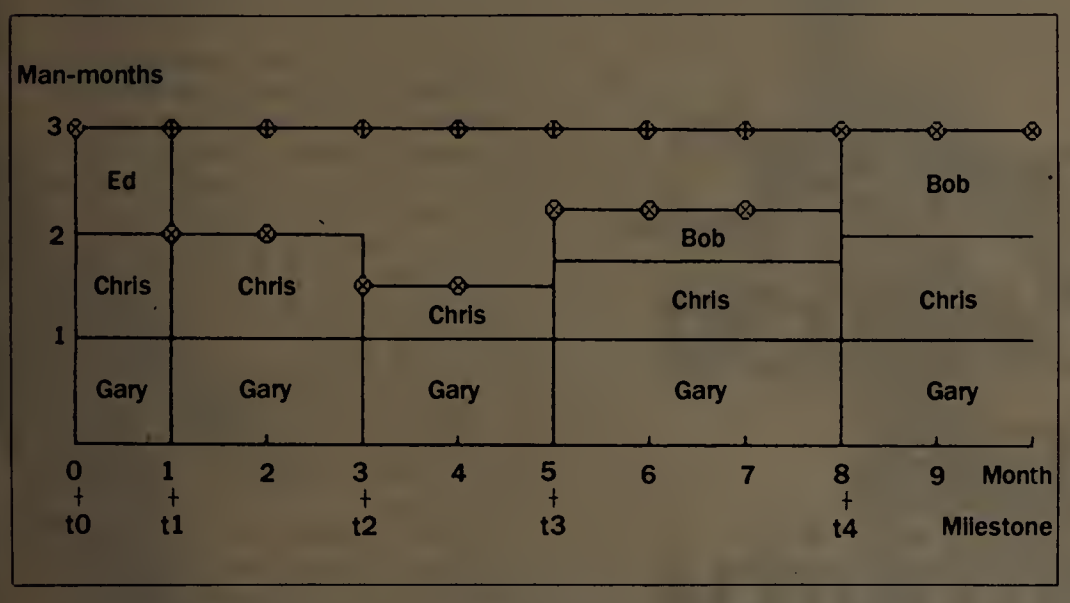


Figure 3. Backlog buildup (shaded area) of critical work

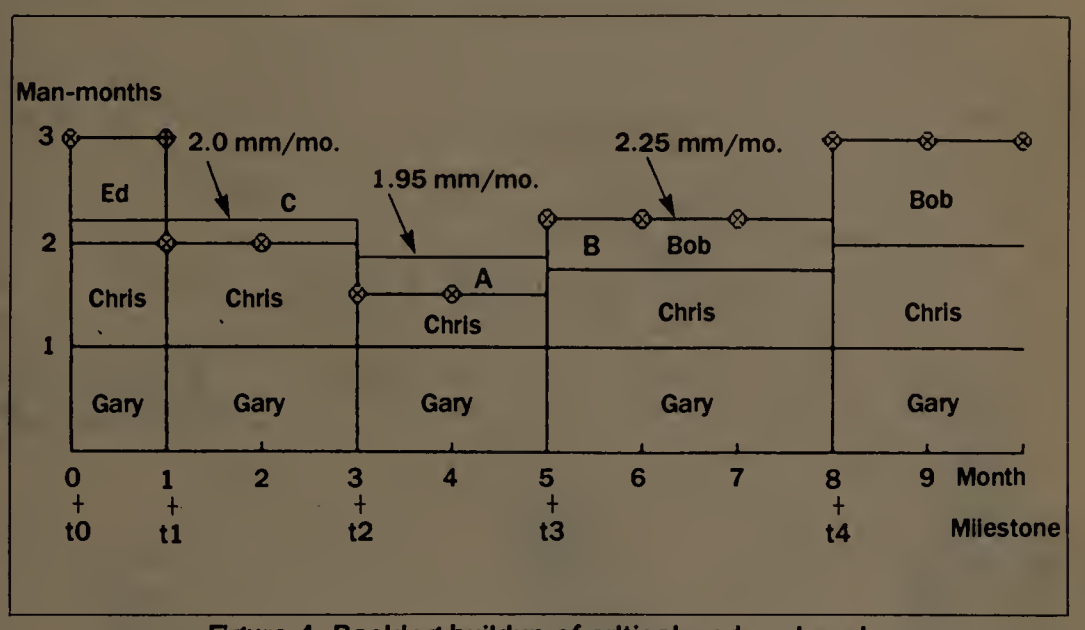


Figure 4. Backlog buildup of critical work reduced

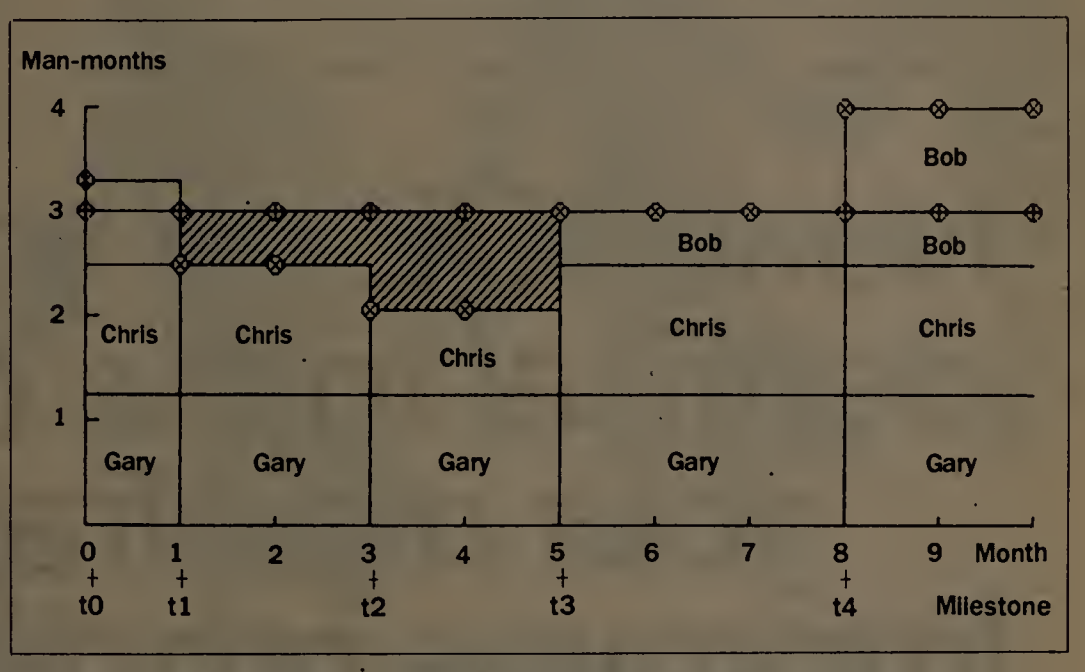


Figure 5. Backlog buildup (shaded area) when Ed leaves



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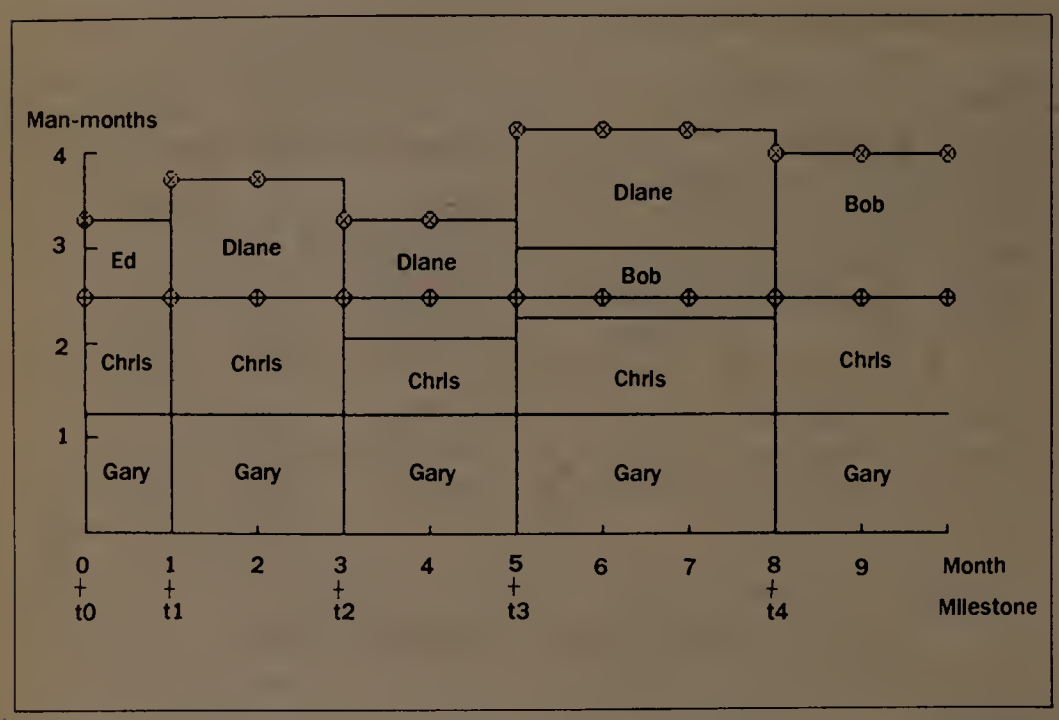


Figure 6. Work capacity according to turnover contingency plan if Ed leaves

the backup person during the time the backup person helps you in maintenance.

Our turnover contingency plan is: Start now, at t_0, to decrease critical work from 3.0 mm/mo to 2.5 mm/mo and make use of the configuration management tool. When Ed leaves, Diane will immediately be shifted to maintenance. When "Bob" is found, Chris will be assigned to train him, as well as continue her maintenance duties. After Bob is up to speed, Diane can go back to development.

Look at what happens to the backlog of critical work in Figure 6 as a result of this contingency plan when Bob becomes fully productive. There is none. And, during the turnover cycle, we'll have no critical-work backlog either. For extra measure, we'll have substantial extra work capacity to handle contingencies until Bob gets up to speed. The average extra work capacity per month from t_1 to t_4 is:

[(extra capacity from t_1 to t_2) +
(extra capacity from t_2 to t_3) +
(extra capacity from t_3 to t_4)]/(no. months from t_1 to t_4)
= (2.5 mm + 1.5 mm + 4.5 mm)/7 mo
= 8.5 mm/7 mo
= 1.2 mm/mo

We're beginning to feel better!

Accurate projections

The quantitative justification — excess work capacity and no accumulated critical-work backlog — of your turnover plan is important both for you and for upper management. Make your "paper projections" as accurate (or conservative) as possible, so you will pass the test should an actual turnover occur.

Ed's threat to leave had us going for awhile, but we'll still survive. Turnover is a lot less troubling when you've got a contingency plan for it.

Just as it is better to draw up a will prior to a serious illness, it is better to draw up a turnover contingency plan prior to turnover. Drawing up and analyzing turnover profiles for everyone in your shop, just as was done here for Ed, will reveal those people whose replacement is most serious in terms of accumulated critical-work backlog. Plans should be made now so that no critical-work backlog is projected should anyone leave.

Some key points to remember are:

■ When doing quantitative turnover contingency planning, several measures are important to consider: The buildup of critical-work backlog during turnover is important because it influences the delays to critical work during and after the turnover cycle. The excess work capacity available while a replacement person is sought and becomes fully productive is important for giving some slack time in your plan should unforeseen difficulties arise during turnover. Finally, the time to clear the critical-work backlog after the replacement person becomes fully productive is important for gauging what delays customers or users must face after the replacement person becomes fully productive.

■ The goal of quantitative turnover contingency planning is to have some excess work capacity during turnover and zero accumulated critical-work backlog when the replacement is fully productive.

■ As a manager, quantitative turnover contingency planning is possible. Draw up quantitative turnover contingency profiles for everyone in your environment, especially those involved with critical work or who you suspect will be hard to replace.

■ Review your turnover contingency plans periodically to update the work generation and work capacity estimates used in your planning. Modify plans if necessary.

About the author

Robert S. Arnold is a member of the technical staff at Mitre Corp. in McLean, Va. His research specialty is software maintenance.

Arnold is program cochairman of the Conference on Software Maintenance — 1985, sponsored by the IEEE Computer Society, the Data Processing Management Association and the National Bureau of Standards. The meeting will be held Nov. 11-13, 1985, in Washington, D.C.

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IN DEPTH

Missing: top management



Structured techniques need executive support

By F.J. Grant

Now, no one seems particularly satisfied with the implementation of structured techniques. And their role is increasingly uncertain given the spreading of personal computers. Even more uncertain is who will be blamed for this state of affairs. I say, blame top management.

Even when experienced developers rigorously apply structured techniques, there is no guarantee that the fundamental objectives of the organization will be furthered or that overall costs associated with automation will be known, controlled or reduced. In fact, the overall developmental cost of software has not decreased significantly over the past 20 years.

There is too often a missing link in the systems development process. The missing link is top management.

The argument for including top management in structured systems development exercises is based on a simple premise: Most organizations fail to produce applications software consistently within budget and on schedule.

Consider for a moment a controlled experiment involving the development of some hypothetical application. A random selection process is used to put together teams of similarly skilled programmers, analysts, users and steering committee members. Based upon your knowledge of the data processing industry, would there be significant differences in the schedule, cost and cost saving associated with the application developed by each team? As you will undoubtedly agree, the various teams probably would not produce quantitatively or qualitatively similar systems.

One might argue that the operational variable in such an experiment is people and readily draw the conclusion that people make a difference. However, consider for a moment people within the context of a business. People represent a resource employed by management to perform specific functions. Within a

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So, why blame top management? Top management is to blame because it got what it asked for, and what it asked for is not what it really wanted.

sufficiently structured environment, people will generally do what they are asked.

Consistent results

In order for any organization to perform work reasonably well, there must be a consistency of results — whether this means that each business form that the organization uses is filled out correctly or whether it is the development of applications software — the success of any business enterprise resolves around assurances of consistency.

When order is not supplied by the organization, most employees will attempt to create order based on their own experiences, convictions and superstitions. This approach may not work. Accordingly, it is reasonable to conclude that the participation and direction of top management may be the real variable conditioning the outcome of such experiments.

Structured techniques evolved because large-scale development efforts were taking far too much time and not producing products consistent with customer requirements. Software development was becoming an increasingly expensive proposition, both economically and politically. The profession desperately needed a methodology in order to sustain itself.

While management probably did not understand the implications of "going structured," it could relate to costs. Hence, almost anything that promised better systems at reduced cost was for a time embraced. Not unexpectedly, there have been some problems with this approach.

For one thing, the results of successful analyst/user interactions did not produce products that were easily digested by management or contained information that was critical to the specification of certain basic management problems. The critical information that was missing usually involved time and cost data. As a rule, products that did not contain time and cost data were generally ignored by top management. Accordingly, structured techniques were deemed "technical" and relegated to the world of the systems analyst, where they have remained to this day.

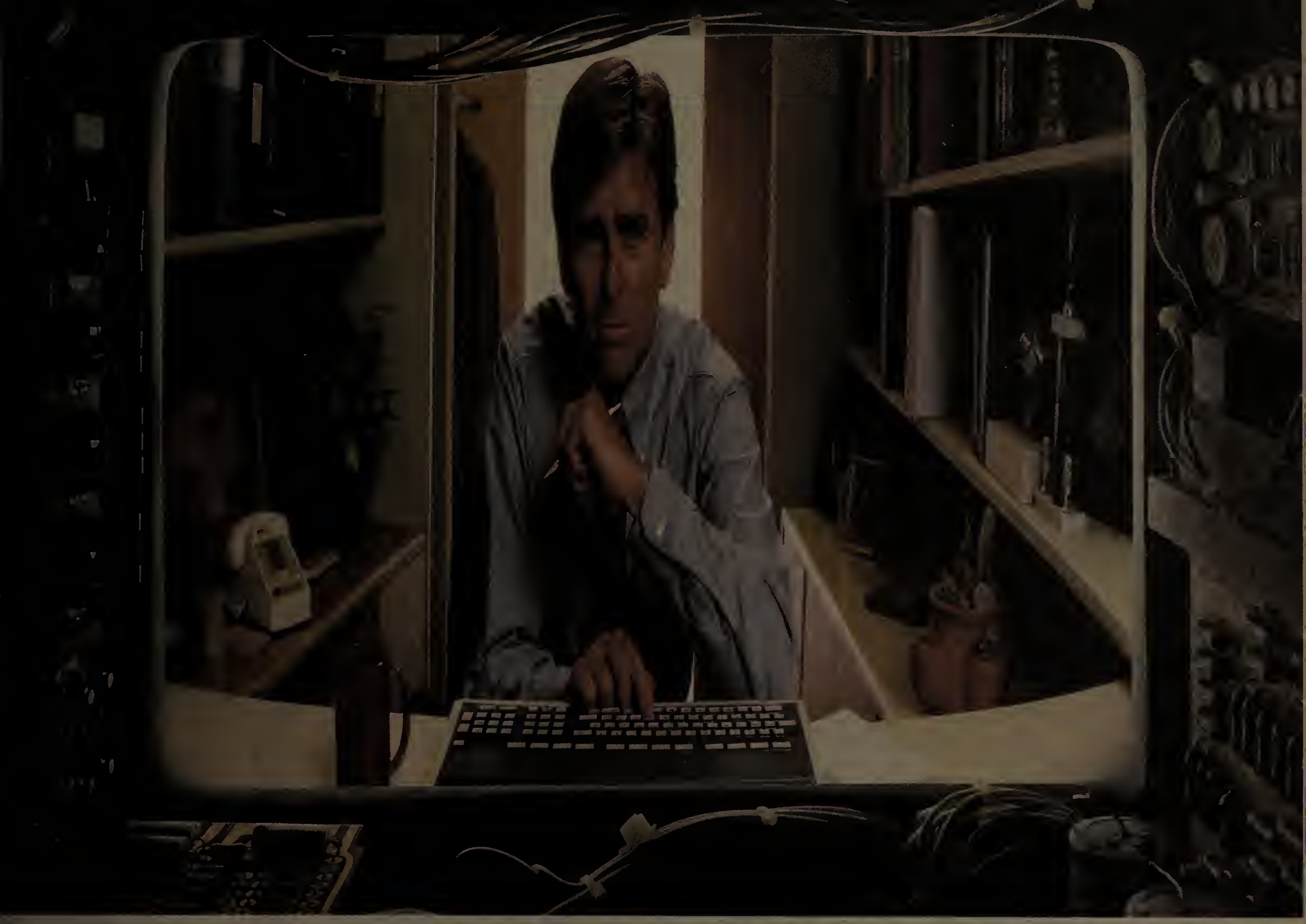
User's influence

In a sense, the boat was missed by everyone but the user, who found that he could now influence the design of the end product. Costs did not fall as expected; however, users were generally more satisfied. Because users were more satisfied, top management was for a time more satisfied — at least until it discovered renegade user empires emerging that did not seem to further the ends of the economic enterprise. Now, no one seems to be particulary satisfied. And with the introduction of personal computers, the role of structured techniques seems increasingly uncertain. Even more uncertain is who will receive the "blame" for this current state of affairs. I say, blame top management.

Despite the fact that top management usually does have representation more or less directly on major DP projects, there is considerable resistance on its part to becoming involved in detailed decision making beyond a certain threshold. Usually, top management is only convened to discuss the most fundamental of policy decisions or be apprised of the overall progress toward implementation.

However, as our hypothetical experiment indicated, important decisions are being made by users, analysts and even programmers (often in a vacuum) that affect the overall

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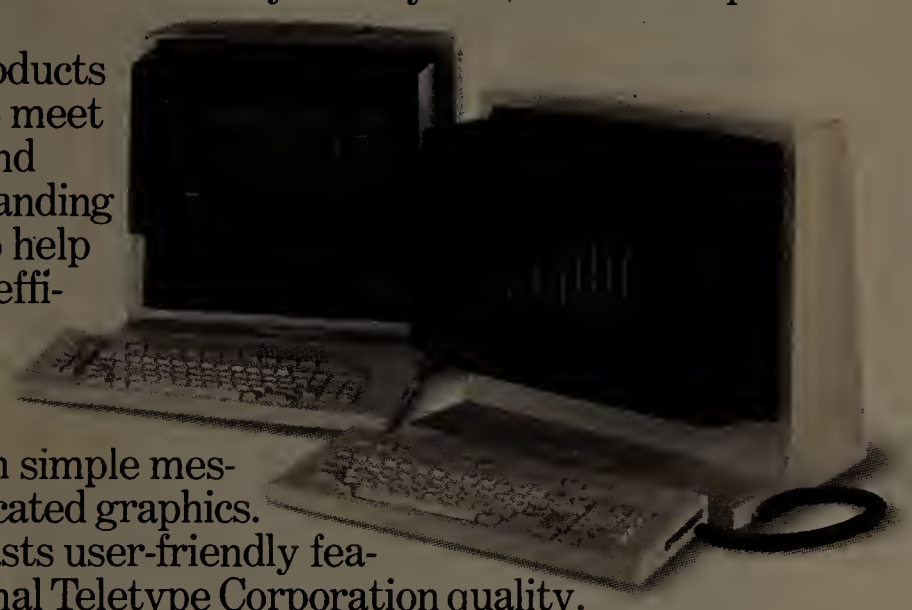
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costs associated with systems development. Schedules, costs and organizational changes are among the fundamental elements that management seeks to control.

In examining why the necessary controls are often not being exercised, it becomes evident that management's reluctance to participate lies in the products to which it would be (and have been) exposed were it inclined to make decisions at more detailed levels.

Feasibility study

Take, for instance, the course of a typical feasibility study by a data processing organization. Assume that a steering committee has been designated, and a project team, including analysts and users, has been constituted. After an initial series of kick-off meetings, the project team sets out to conduct the study using a generally accepted structured methodology to analyze current methods and access the feasibility of the new system. During the course of the study, the following activities are undertaken:

■ The current method of doing things is documented and analyzed. A systems analyst is assigned to work with the affected user departments to produce "as is" documentation. This documentation is usually a graphical depiction of the operations of the current system supported by specifications explaining the detailed flows of work between the functional entities.

This model, often drawn by hand, will come to represent a baseline from which a logical view of the system can be deduced. The iterations of physical modeling utilizing this approach often represent a learning curve for both the analyst and the users.

Occasionally, during this process, an astute analyst/user team will come to the realization that some functional entities are really nonfunctional entities. For a number of reasons, these findings are never formally summarized.

Cursory review

In other instances, depending upon the experience of the respective analysts and users, a seemingly unimportant function will be overlooked. In later phases of the project this function will become an enhancement to the system. In all cases, this documentation will receive only a cursory review, if it is reviewed at all, by the management empowering the study.

■ The feasibility of the new system is assessed. The systems analyst, based upon his knowledge of the current system, the hardware available, stated user requirements and, above all, what he believes management desires, derives a new model. This new model, usually hand drawn with supporting notations as required, provides the conceptual foundation for discussions of the new automated system and its feasibility.

Few systems are ever deemed unfeasible. During this process, a number of technical and nontechnical judgments are made, as well as an estimate of the resources required to complete the project. Resources usually means number of programmers, amount of hardware and a "best guess" of the amount of time the project will take.

■ The feasibility report is produced and disseminated. High-level diagrams that show how the new system will operate are prominently featured. The feasibility report will often (invalidly) compare and contrast in aggregate terms estimated cost

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data for both the old and new system. (Note that this cost data has not really been associated with the model of either the old or new system; it stands alone.)

Some type of analysis concerning payback or the savings to be associated with automation is also invariably included. Notations such as these are rare: A new department will be required; the functions of department X should be (always should have been) performed by department Y; or no department was ever required.

Does top management know that it is the missing link? Flatly stated, no. Top management generally does not consider itself in this light. I do not recommend that you inform it so.

In short, the executive summary will read: The new system is feasible; there are costs associated with the new system; this is what we believe they are (but please don't ask for too many details because we are guessing); the project can be completed in x man-months; and this is the number of programmer/analysts that should be assigned.

■ Management reads the executive summary and looks at the costs provided. A "go" or "no-go" decision is awaited.

Insofar as the majority of the effort to conduct the feasibility study revolved around a structured analysis methodology, is it not reasonable to expect that the products of this effort should directly support the content and conclusions of the study? Knowing what you know about DP, did top management get what it needed?

So, why blame top management? Top management is to blame because it got what it asked for, and what it asked for is not what it really wanted.

Cost analysis

To top management, a "feasibility study" is foremost an analysis of what it costs the company to perform a certain function. It is next a study of what it might cost the company if certain automation options were exercised.

Whose job is it to perform this function? The systems analysts and users assigned to conduct the feasibility study can give no assurances that the proposed design is compatible with long-range corporate goals and objectives, nor should they be expected to do so.

There is nothing inherent within structured techniques that considers the current state or life cycle of the organization or system; assigns detail costs to components of existing or newly proposed systems at functional levels; outlines when and where the resources for the project should be committed; and points out those elements of a project that should be considered foundational to the growth of the business or show where an immediate payback can be achieved. (Included in this are the issues of overall organizational impact and management span-of-control requirements.) These are management imperatives.

Made, not born

The formality of structured methods is such that good analysts are made — not born. However, regardless of the method employed, some analysts will always produce studies and designs that are inferior to others. Current incentives in business and education have

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spawned a generation of career-tracked technical types who lack an orientation to the financial options. This situation will be exacerbated as the information age results in the promotion of extremely competent "trade-school" programmers to analyst positions.

Guidance quest

Systems analysts should not be expected to seek guidance from management while making fundamental decisions about the design of a new system. Guidance should already be present.

Without incentives to critical reviews, change and other types of measures enforced by top management, there will be little that structured techniques can do in and of themselves to improve outright the quality of information systems and the performance of the business. In short, there are few products from structured analysis and design techniques to which management can directly relate.

Without incentives to critical reviews, change and other types of measures enforced by top management, there will be little that structured techniques can do in and of themselves to improve outright the quality of information systems and the performance of the business.

This is management's fault. Even with structured methodologies that can be modified to incorporate cost data directly, it is unclear exactly who should be performing such work. For many organizations, it would seem inappropriate for a technically oriented systems analyst to take on this additional work.

Evolving awareness

Does top management know that it is the missing link? Flatly stated, no. Top management generally does not consider itself in this light. I do not recommend that you inform it so. What I can recommend is that we as a profession revise the quality of our reporting mechanisms using the computer-based tools that we have at our disposal and develop new ones if we must.

Management needs to evolve into the same awareness that DP professionals share. And this awareness must be in terms management can directly understand: dollars. Perhaps we should exchange our data flow diagrams for dollar flow diagrams.

Despite the fact that organizations often possess well-integrated strategic and tactical management plans, there is still considerable naivete associated with the design and implementation of systems at the highest levels of management.

Given the current state of the art, top management's understanding, participation and management of structured techniques are fundamental to ensure the consistency of the development of software end products. Frankly, top management is generally not prepared to do this.

It is ironic that the original organizational placement of the data processing function was squarely under finance. Given this historical foundation, one questions how business data processing rose to prominence without carrying forth certain basic tenets of the finance discipline.

Quid pro quo

In business, the fundamental purpose for the introduction of data processing technologies was to make the organization more profitable. This is no longer true. Profitable or not, a data processing organization is a quid pro quo for entrance into any competitive marketplace. Given this orientation, it will be surprising to ever find the "cost of computing" as a balance sheet item even though it would probably be just as accurate an indicator of the management strength of a business as an acid test ratio.

As information systems become *the* business rather than a part of the business, focus on the question of top management participation will become critical. The insistence on participation by directors of information systems organizations will undoubtedly provide a number of job openings.

This is the reason why, despite the best efforts of the profession, systems development will remain an art rather than a science. It is also the reason why all of your good analysts are currently underpaid.

About the author

F.J. Grant is MIS systems coordinator, DP systems and programming, for Lockheed-Georgia Co., a division of Lockheed Corp.

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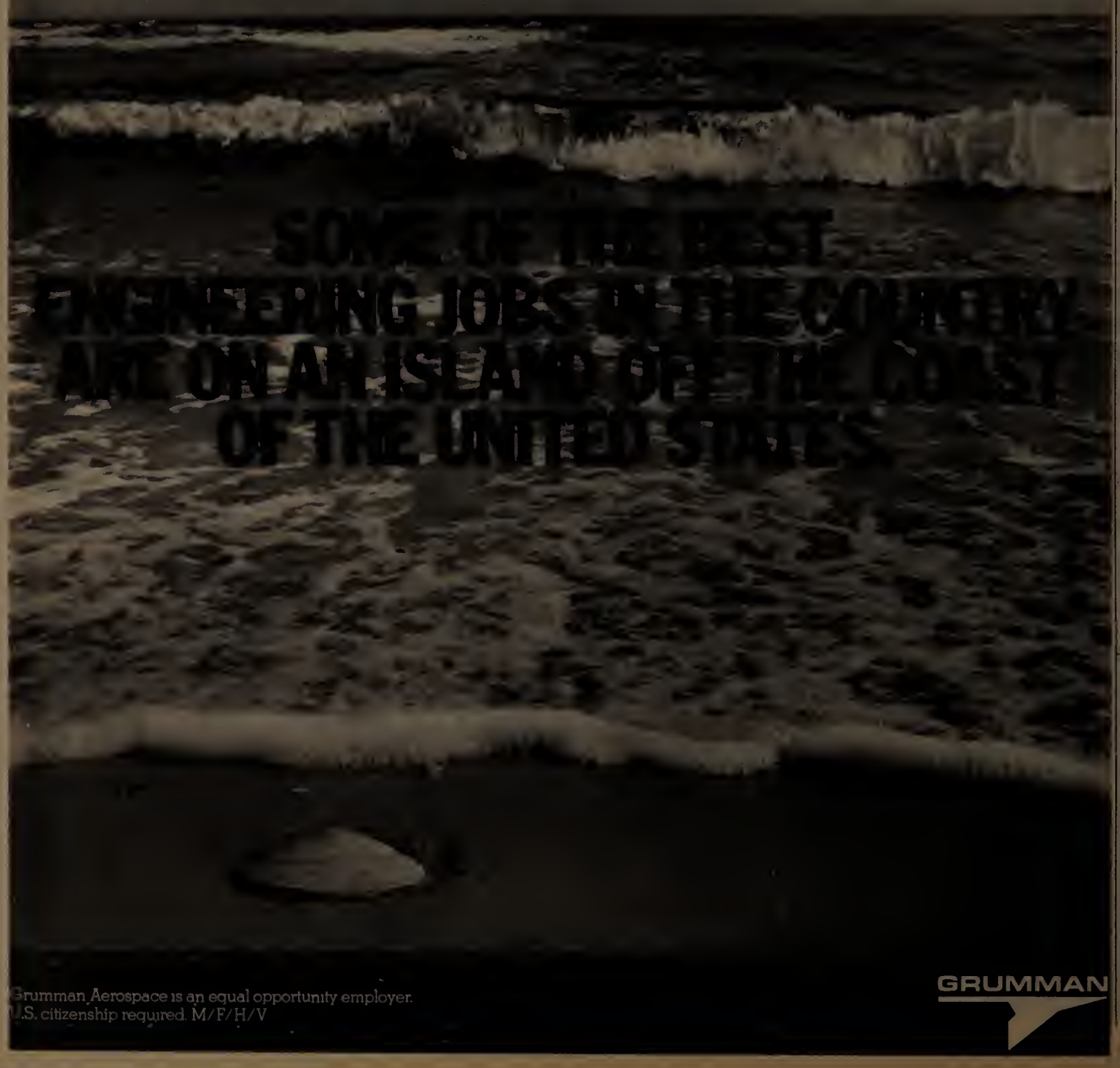
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Profiting from access changes may require retooling



DATA STREAM
John Dix
CW Senior Editor

Telecommunications users looking to reap the greatest economic benefits from equal access should be studying how best to use discount long-distance services and figuring out what modifications have to be made to their switches to access those services.

Under the terms of the AT&T divestiture, the divested Bell operating companies are required to provide long-distance carriers with the option to lease access to their local systems that is equal in quality to the access AT&T enjoys.

The lengthy process to upgrade the telephone system for equal access culminated for the year on Sept. 1, when the single largest concentration of cities was cut over. These included New York, Philadelphia, Washington, D.C., Detroit, Milwaukee, Baltimore and a number of smaller cities.

With equal access, carriers like MCI Communications Corp. and GTE Sprint Communications Corp. will be able to offer higher quality service, more accurate billing and easy service access.

These improvements will make the discount long-distance services more appealing to large businesses. Few companies, however, are expected to swap carriers on a wholesale basis.

Instead, cost-conscious users are expected to rely on a new dialing option that will enable them to program their private branch exchanges (PBX) to access the alternate carriers for certain routes where favorable tariffs are available.

Some switches, however, are not capable of recognizing when a call should be deferred to another carrier or cannot insert the digits needed to access that carrier. Most notably, switches from AT&T Information Systems lack this capability. A company spokeswoman said that while the company is in the process of developing the required software, none of AT&T's switches — including the newer Dimension System 85 and System 75 — can take advantage of the dialing options created by equal access.

Other manufacturers, such as Rolm Corp. and Northern Telecom, Inc. report that their switches can be reprogrammed to access the discount long-distance carriers using what is being called the

See **ACCESS** page 84

DTS and cable systems seen becoming more viable

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Digital Termination Services (DTS) are now operational or being tested in nine cities, reported Dr. Jerome Lucas, president of Telestrategies, Inc., of McLean, Va., a consulting firm that specializes in tracking this and other types of bypass communications.

Lucas, speaking at a seminar here sponsored by his firm, said the nine cities are Chicago, Dallas, Houston, Los Angeles, Miami, New York, Philadelphia, San Francisco and Washington, D.C.

He also reported that in 1983, bypass revenues totaled $645 million, all but $45 million of which came from microwave. (Satellite-based bypass services generated revenues of $40 million; CATV $4 million; and teleports $1 million.) He added that as of Jan. 1, 1984, teleports were operating in eight cities: Denver; Seattle; Salt Lake City; Phoenix; Raleigh, N.C.; Tallahassee, Fla.; Washington, D.C.; and Chicago.

Another seminar speaker, Dr. Alan Pearce, president of Information Age Economics, a Washington, D.C.-based consulting firm, reported that a recent study conducted by his company found at least 143 institutional CATV networks in the U.S. are being used to carry data.

Neither speaker made any concrete predictions about how quickly bypass will increase its presently miniscule market share, but they clearly believe bypass is growing rapidly in terms of both customers and applications.

Lucas, for example, pointed out that although bypass began as a way of sidestepping the local telephone exchange to get to the long-distance carriers, it is now becoming an alternative to local service as well.

In many states, he explained, building owners are allowed to resell local business access lines. Offering this capacity to their tenants on a shared basis reduces access fees by about 20%, Lucas said.

Alternatives to local exchange service are bound to become increasingly plentiful and cost-effective, he added. This is due, in part, to technology, and partly to the fact that local telephone companies are likely to increase their rates for tariffed services.

Citing the effect of evolving technology, Lucas said that DTS is becoming an increasingly viable form of bypass because the newer systems have much greater capacity than earlier systems. And two-way cable networks are continuing to spread across the nation, many with capacity dedicated to business applications and users.

See **LUCAS** page 84

SBS

■ Satellite Business Systems will use its fourth satellite, launched on the space shuttle *Discovery*, to expand its Skyline telecommunications service and to bolster its transponder leasing program/**82**

■ Controlonics Corp.'s Nonwire Division announced a modem that uses electrical building wire to connect devices instead of telephone or dedicated wire/**82**

INSIDE

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Auxiliary Equipment/**86**

Southwestern Bell's fiber-optic net said to be largest of its kind

ST. LOUIS — Southwestern Bell Corp.'s 44-story headquarters building under construction here will reportedly feature the largest end-to-end fiber-optic network installed to date for its computers.

"We're not aware of another installation of this kind anywhere else in the country," said Dave Stein, a project manager for Southwestern Bell Telephone Co., which is installing the system for Southwestern Bell Corp. and is a subsidiary of that divested Bell operating company.

The $1.5 million installation, a local-area network being designed by Southwestern Bell Telephone engineers, will carry data transmissions over 16 miles of fiber-optic cable. The $120 million building is scheduled to open in mid-1985.

The cable will interconnect 1,500 IBM and Wang Laboratories, Inc. computer terminals and computers, which in turn will be linked by a yet-to-be chosen means to IBM 3081, IBM 3083 and Amdahl Corp. 470V/6 mainframes in another part of St. Louis.

Another fiber-optic network, scheduled for completion after the building opens, will be used for two-way video teleconferencing.

Stein noted that in the past, fiber-optic cable has been used primarily for long-distance transmissions and for connecting telephone company switching offices to each other and to customer locations.

"We've decided to use an in-house fiber-optic system because it is more economical and more efficient. If you used copper cable to connect all of those terminals and the main computers, you'd have cables running all over the floor and huge cable ducts throughout the structure," Stein said.

A pair of fibers can handle from 600 to 8,000 circuits, depending upon the equipment used with the system,

See **NET** page 84

Tact Technology introduces line access control device

PHILADELPHIA — Tact Technology, Inc. recently unveiled an access control device designed to provide callback computer security and intruder alarms for up to 128 telephone lines.

Multisentry reportedly responds to each call in less than a second, providing each of the 128 dial-up data lines with its own individual call-answer and callback circuitry.

According to the company, Multisentry answers each call with a life-like synthesized voice, which prompts the caller for identification. If a valid access code is entered, Multisentry clears the call for system access. If an invalid code is attempted, visual and audible alarms are triggered.

Multisentry is said to allow codes to be entered through the keys of a Touch-Tone telephone or by voice commands when using rotary-dial telephones. It operates on the analog side of the host modem, preventing unauthorized callers from identifying a data center by random dialing in search of modem tones.

It features three access capabilities: direct connect on verification of password; assigned callback to a single predetermined number; and variable callback to different numbers. A choice of two alarm modes is also featured, one that reduces the number of attempts a caller can have to enter a valid code and one that prevents further access to the system, according to the vendor.

The device also provides an interface for a personal computer, to which invalid calls can be routed to keep the would-be intruder intrigued while a trace is put on the call.

It is said to allow use of 1,000 access codes of up to 10 digits each.

Available now in stand-alone or rack-mount configurations, Multisentry prices start at $21,000.

Tact Technology is located at 100 N. 20th St., Philadelphia, Pa. 19103.

Controlonics unveils modem

CHELMSFORD, Mass. — The Nonwire Division of Controlonics Corp. has introduced an intelligent modem said to allow a local-area network to be built using the existing ac power wiring within a building.

The Nonwire modem provides 1,200 bit/sec full-duplex data exchange between two individual units, or between one unit and other units on a multidrop network, over the wiring used to provide power to all electrical outlets within a building.

Any outlet can thus provide an interface for terminals, printers and other peripherals to a host computer.

Nonwire reported that the modem incorporates multiple error detection and correction algorithms to provide a transparent, error-free link between RS-232C- or RS-422A-compatible devices. It is said to let the host communicate with, broadcast to or poll up to 255 devices, which may be up to 5,000 ft apart.

IBM Personal Computer-compatible software for on-line use is also available.

Standard operating voltage is 120 Vac, although 240V and 277V are optional. The units were designed to operate at temperatures up to 65 degrees Celsius.

The modems are priced from $312 in quantities of 100.

Controlonics' Nonwire Division is located at 4 Kidder Road, Chelmsford, Mass. 01824.

ITT offers bulk discount rates for long-distance business calls

SECAUCUS, N.J. — ITT has introduced what it claims are the telecommunications industry's first bulk discount rates for all business calls.

The rates for ITT USA service, provided by ITT's U.S. Transmission Systems, Inc., were scheduled to take effect Sept. 1.

According to ITT, the rates are designed for customers using at least 25 hours, or $300 worth, of long-distance service each month.

The company said the rates are 25% lower than AT&T's Wats and remove the confusion of rates based on tiers relating to calling volume and distance.

For customers calling at least 25 hours per month, the USA rates are 27 cents a minute on weekdays and 12 cents a minute at night. For usage over 125 hours per month, the rates are 21 cents a minute weekdays and 10½ cents a minute at night.

ITT, which provides direct-access lines from the customer's office or home to the ITT switching center, also announced that it is waiving its $100 installation charge on orders placed in September for installation before Dec. 31.

More information is available from ITT, which is located at 100 Plaza Drive, Secaucus, N.J. 07069.

United Telecom, Conrail right-of-way pact brings United closer to core communications system

WESTWOOD, Kan. — United Telecom Communications, Inc., in its quest to develop a long-distance communications system, recently signed an agreement with Consolidated Rail Corp. (Conrail) for up to 3,250 miles of right-of-way for the installation of fiber-optic cable.

The specific terms of the agreement with Conrail were not disclosed, but United Telecom said that it was a multimillion dollar pact that will put United over the halfway mark in the development of its core communications system.

Preliminary engineering activities are under way for a leg of the network extending from Erie, Pa., through Rochester, N.Y., to Buffalo, N.Y. Construction along the Conrail easements is expected to begin in 1985. The ultimate goal is to interconnect the nation's 184 Local Access Transport Areas.

The network is scheduled for completion in 1987, by which time more than 23,000 miles of fiber-optic cable should be in place.

United Telecom Communications, a subsidiary of United Telecommunications, Inc., is located at 2330 Johnson Drive, Westwood, Kan. 66205.

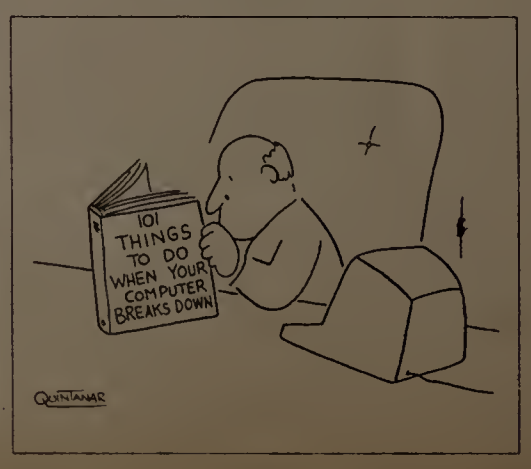
SBS satellite to expand phone service

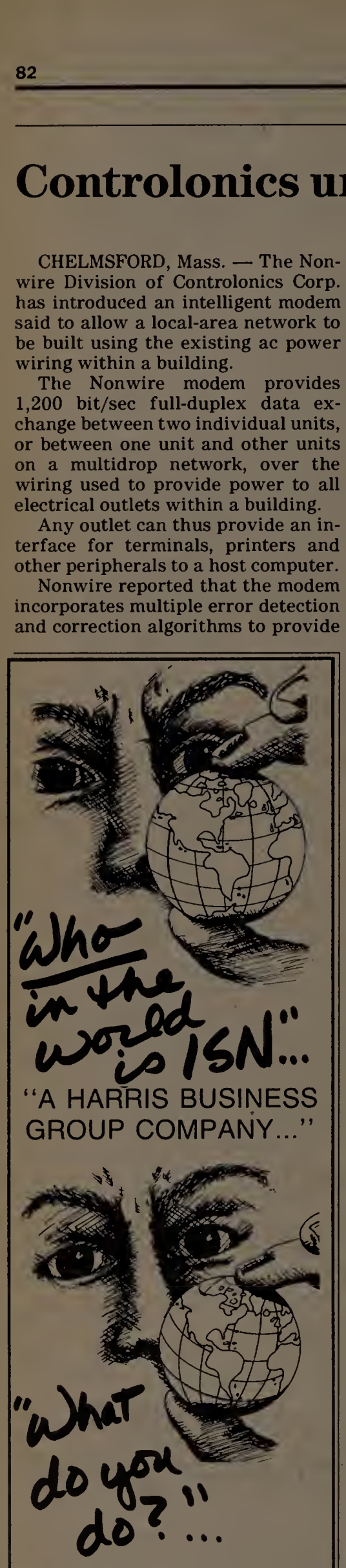
CAPE CANAVERAL, Fla. — The maiden voyage of the space shuttle *Discovery*, delayed once and finally launched here Aug. 30, carried aloft the fourth Satellite Business Systems (SBS) satellite.

Five of the satellite's 10 transponders — power amplifiers that are also used to shift radio frequencies — will be used to expand the company's Skyline long-distance telephone service, the company reported.

The remaining capacity will reportedly enable the company to dedicate reserve capacity on other SBS satellites for the expansion of its private network services.

SBS President Stephen B. Schwartz said the new satellite will also provide added capacity for the company's transponder leasing program, particularly to television broadcasting organizations.





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COMMUNICATIONS

CONTROLLERS

GENERAL ELECTRIC CO. CCM3

General Electric Co. has announced an interface designed to link its Series Six programmable controllers with the Honeywell, Inc. TDC 3000 distributed control system through Honeywell's Data Hiway Port.

The CCM3 reportedly connects up to six Series Six controllers, which are industrial computers used to control machinery and industrial processes, to the Data Hiway Port for transmission of analog and discrete data.

The module costs $1,500.

GE, P.O. Box 5900, 101 Merritt 7, Norwalk, Conn. 06856.

VOICE/DATA COMMUNICATIONS

HARRIS CORP.
Private branch exchange compatibility with industry regulations

Harris Corp.'s Digital Telephone Systems Division announced that its 110 and 400/1200 private branch exchanges (PBX) are now compatible with industry regulations governing equal access phone service.

The 110 and 400/1200 PBXs are said to meet all equal access switching requirements when equipped with the vendor's Automatic Route Selection Software, according to the vendor.

Harris, 1 Digital Drive, Novato, Calif. 94947.

ACCESS from page 81

10XXX dialing option.

This option becomes available when a local telephone company upgrades its facilities for equal access. When this is completed, the telephone companies will ask users to choose a primary long-distance carrier. Once that selection is made, all normally dialed long-distance calls will be routed to that carrier. If a user does not presubscribe to a carrier, his calls will usually be routed, by default, to AT&T Communications.

All users, however, will be able to use the new dialing option to access carriers other than their primary choice by entering the number 10 followed by a three-digit carrier identification number.

Reprogram routing

Corporations wishing to capitalize on this would need to reprogram the least-cost routing feature on their PBXs to recognize when alternate carriers should be used.

"The communications manager, in association with the PBX distributor, should set up the long-distance routing tables in the least-cost routing sequence to insert the 10XXX for calls where an economic benefit can be realized by routing them over a carrier other than the one [he's] presubscribed to," noted Ed Ellesson, product manager of Rolm's wide-area network products.

Depending on the number of changes required, this upgrade may be done by a manufacturer's or distributor's field representative or may require the user's software load to be reconfigured by the vendor.

Lois Mitchell, group product manager of Northern Telecom's SL-1 voice products, said she anticipates that some large users will use 10XXX dialing to take advantage of the discount specials carriers are offering while competing for market share. "We see the telecommunications managers changing the least-cost routing tables in the PBX so that the cheapest routes will become first choice for different months of the year."

LUCAS from page 81

Although bypass is an obvious threat to local telephone companies, they may secretly welcome it, Pearce noted. To the extent bypass increases local exchange competition, it will pressure the U.S. Department of Justice and U.S. District Court Judge Harold Greene to let the divested Bell operating companies offer services beyond their present territories, he reasoned.

Pearce also contended that:

■ Judge Greene's recent decision allowing the seven regional Bell holding companies to enter new markets only if they satisfy a number of requirements cannot be justified. One reason is that similar restraints are not imposed on competing firms, such as IBM and Xerox Corp., which enjoy similar monopolies in their fields.

■ The commissioners of the Federal Communications Commission would like to deregulate AT&T, but "it's not going to happen soon." According to Pearce, the FCC staff sees continued regulation as a way of holding on to their jobs, and they have support on Capitol Hill.

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with each fiber strand serving from 16 to 32 terminals, he noted. Those terminals will be linked through multiplexers, the vendor for which has not yet been chosen.

The 587-ft-high building at One Bell Center will house 6,000 employees now working in leased office space throughout downtown St. Louis. Voice communications for the 5,400-telephone network will be carried by copper wire.



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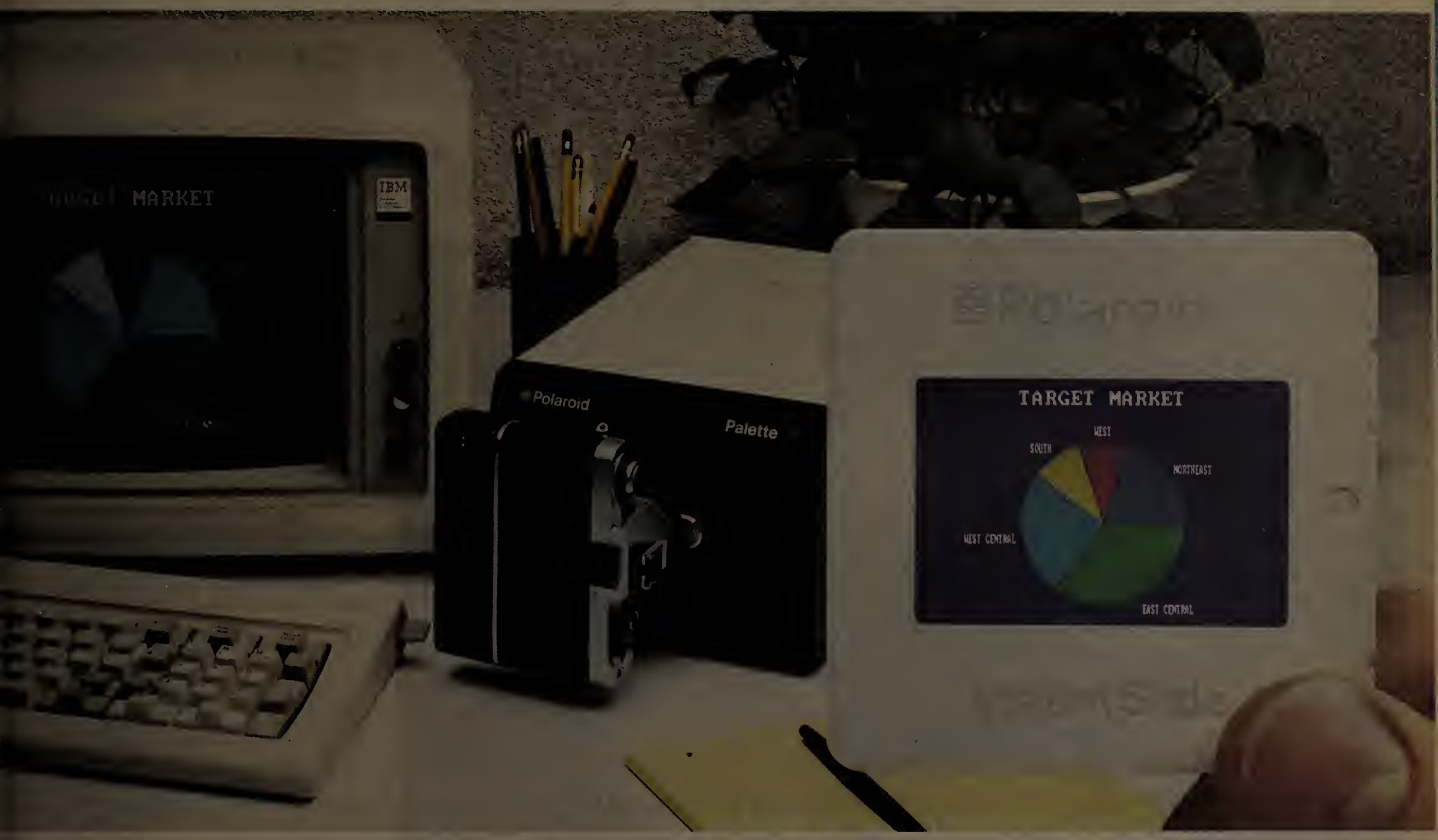
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COMMUNICATIONS

PROTOCOL CONVERTERS

INNOVATIVE ELECTRONICS, INC.
MC 80/900

Innovative Electronics, Inc. has announced a protocol converter designed to allow personal computers and Ascii terminals to access concurrently IBM mainframe environments and Ascii hosts in either local or remote configurations.

The microprocessor-based MC 80/900 reportedly allows Ascii terminals and personal computers to appear to IBM hosts as IBM 3278 Model 2 display stations.

The converter connects by coaxial cable to an IBM 3274/76 cluster controller or to the display/printer adapter of an IBM 4331.

An auxiliary RS-232 port is said to allow an attached personal computer or Ascii terminal to have simultaneous passthrough access to an asynchronous minicomputer or public data base.

The protocol converter costs $1,095.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

MULTIPLEXERS/ MODEMS

AVANTI COMMUNICATIONS CORP.
TPAC-1.5

Avanti Communications Corp. has announced a T1 modem designed as an alternative to the Western Electric 306 modem.

The TPAC-1.5 also is said to meet AT&T T1 Accunet frame format requirements and to feature multiport capabilities and voice and data integration.

The TPAC-1.5 is targeted to applications such as digital data service, satellite and terrestrial networks, video teleconferencing and computer-aided design and manufacturing uses. It features independent clocking capability that allows it to accept multiple timing sources, Avanti said.

According to the vendor, continuously variable slope delta modulation is used to digitize voice signals at 16K, 24K, 32K or 64K bit/sec.

It costs about $9,000.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

ADVANCED FIBEROPTICS CORP.
AFI-232

Advanced Fiberoptics Corp. has announced four models of fiber-optic RS-232C modems said to be configurable for either host-supplied or external power.

The AFI-232 modems reportedly provide full-duplex asynchronous communications at rates in excess of 56K bit/sec and half-duplex operation with handshaking capability.

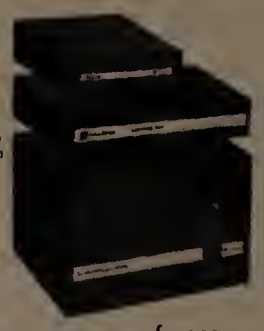
The AFI-232 comes in four models, two with subminiature A-type connectors and two with AMP, Inc.'s Optimate connectors; two are for short-distance applications with plastic cable up to 100 meters long, and two are for long-distance use up to several kilometers, the vendor said.

Prices for the modems begin at $149.

Advanced Fiberoptics, 637 S. Hayden Road, Tempe, Ariz. 85281.



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NETWORK SERVICES

WESTERN UNION, INC.
Dial-Up Telex service

Western Union, Inc. has announced that dial-up access is now available for its domestic and international Telex service.

The dial-up access enables Telex subscribers to access the service over regular telephone lines instead of the previously required dedicated lines.

Western Union said that initially only Telex I (66 word/min) subscribers can use dial-up access, but that dial-up access will be offered for Telex II (100 word/min) users later in the fall.

Rates for the dial-up service are $15/mo in cities and $45/mo in remote areas. There also is a 52 cents/min usage charge.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

AUXILIARY EQUIPMENT

HENRIKSEN DATA SYSTEMS, INC.
Comm Center IIX

Henriksen Data Systems, Inc. has introduced a word processer that is said to be designed for office comunications purposes.

The diskette-based Comm Center IIX can upload data to or download data from an IBM Personal Computer.

The word processor has a resident text editor, but also provides the option of preparing data for transmission utilizing the user's own word processing editor, the vendor said.

The unit has 16K bytes to 32K bytes of memory, an internal AT&T 103 modem for direct connection to any message service, host computer or time-sharing net by phone, 70 days of battery backup and cartridge programming to allow updating.

It features both direct-distance dialing and direct Telex line interfaces with Western Union, Inc. or any of five other record carriers, as well as formatting and logging to Western Union's Easylink network, the vendor said.

Price is $1,095.

Henriksen Data Systems, 12325 W. 52nd Ave., Wheat Ridge, Colo. 80033.

SYSTEMS & PERIPHERALS

Firm plans off-line-based nationwide POS net

By James Connolly
CW Staff

PORTLAND, Maine — One of the first point-of-sale retailing systems to rely primarily on off-line credit authorization and reporting is being promoted by a local firm that hopes to boost its network from three automated gas stations in Maine to 4,000 stations nationwide.

While other point-of-sale systems, including several run by major oil companies, offer on-line credit authorization, transaction recording and funds transfer, the Wright Express Corp. system focuses on off-line credit authorization and transaction reporting. It leaves the retailer or other credit issuer to collect the bills.

Wright Express, which developed the network and terminal software for its system, has launched a national marketing campaign with NCR Corp., emphasizing the reduced communications costs associated with point-of-sale terminals that handle most transactions in an off-line mode.



Poole (left) shows client a report.

NCR is selling its terminals — the NCR 1830 Self Service Terminals and NCR 2950 data terminals — for use in the automated stations.

"It costs $7 to $8, in some cases $10, per day for a dedicated line. We can do the job with less than six minutes of connect time each day for polling the terminals and updating the negative data base," claimed Parker Poole III, president of Wright Express.

The Wright Express system, according to Poole, consists of an NCR 8545 minicomputer in the company's Portland headquarters (to be replaced by an NCR 8585 mainframe in a Hartford, Conn., data center in 1985) Wright Express' networking software, microcomputer-based terminals and 5M- to 10M-byte hard disk drives at the gas stations.

Potential participants are regional, and to a lesser extent national, petroleum distribution companies that operate strings of gas stations and large motor vehicle fleet operations. Poole said those participants would purchase terminals, priced at about $15,000 for a one-island station, and use the network for a charge ranging from 1½% to 4% of sales, depending upon the amount of service desired.

Wright Express credit cardholders, 2,500 of whom have been using cards at the three Maine stations, will include commercial fleets, such as trucking operations

See WRIGHT page 98

■ Floating Point Systems, Inc. unveiled a hardware and software link to Honeywell Information Systems, Inc. DPS 8/C mainframes/**88**

INSIDE

Data Storage/**88**
Terminals/**88**
Printers/Plotters/**88**
Auxiliary Equipment/**89**

Lisp announces 3-D real-time color graphics subsystem

LOS ANGELES — Lisp Machine, Inc. has announced a real-time, three-dimensional color graphics subsystem for its Lambda family of 32-bit superminicomputers. The enhancement involves adding a graphics workstation developed by Silicon Graphics, Inc.

Called the Iris, the workstation includes a 1,024- by 1,024-pixel raster image memory, displayed on a 1,024- by 768-pixel 19-in. red-green-blue monitor, the company said. The system is said to have 12 bits of image memory, expandable to 24 bits and yielding more than 16 million colors. Featuring Silicon's Geometry Engine for display processing and real-time manipulation of three-dimensional images, the Iris unit is said to allow computer-generated animation at rates exceeding 65,000 three-dimensional transformation/sec. Iris features its own Motorola, Inc. 68000 microprocessor, the company said.

Ten Geometry Engines handle object rotation, translation, scaling, four-plane clipping and perspective or orthographic viewing, the company said. In addition, the Iris Graphics Library is said to furnish more than 150 graphics subroutines accessible to user programs.

The interface of the Iris is through Intel Corp.'s Multibus on the Lambda and through a separate Iris Multibus, the company said. The double interface is said to allow both buses to operate asynchronously. The interface also provides windowing for interbus communications so that loads on the Lambda Multibus will

See LISP page 94

McAuto's GDS available for DEC Microvax-1 CPUs

By John Desmond
CW Staff

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has announced that its computer-aided design system, called the General Drafting System (GDS), is now available for operation on Digital Equipment Corp.'s Microvax-1 CPUs.

GDS has previously been available only on large DEC and Prime Computer, Inc. 32-bit minicomputers.

The turnkey configuration includes a 32-bit Microvax-1, 1.5M bytes of main memory, 31M bytes of disk storage, floppy disk, local terminal and printer, a 13-in. color graphics workstation and the GDS software, the company said.

Software options are said to include a three-dimensional visualization module, solids and color-shading module and a space planning module. Plotters, hard-copy units, higher resolution raster terminals and the Ethernet local-area network are also offered, the company said.

The Ethernet network permits larger networks of Microvax-1 workstations, the company said. The Microvax-1 is said to be capable of executing McAuto's Strudl, Cogo and Roads engineering and design analysis programs and of passing data to GDS for drawing design and construction plans.

The price of the turnkey configuration is $67,750, the vendor said.

More information is available from McDonnell Douglas, P.O. Box 516, St. Louis, Mo. 63166.

IBM's 3080 fire sale: Is Sierra lurking behind the smoke?

HARD TALK
Tom Henkel
CW Senior Editor

IBM's recent round of price cuts on its 3080 line of mainframes and some associated key peripherals has convinced most industry watchers that the successor to the 3080 line, dubbed the Sierra, is just around the corner.

One industry watcher commented that the last time IBM made a similar series of prices cuts — traditionally called a fire sale — on a single processor line was back in 1981, when IBM was gearing up to replace the 3033 mainframe line with the 3080 line.

More recently, however, especially since IBM and the U.S. government resolved their 13-year antitrust case, IBM seems to have been taking a more subtle approach to pricing changes, presumably to confound the competition and all the analysts who make a living watching IBM.

For example, pricing changes on specific lines are often bundled into larger pricing actions affecting many different product lines. Also, some cuts have been hidden. For example, earlier this year, IBM unveiled a $16,000 performance upgrade for users of the base models of the 3080 processors. On one hand, the performance upgrade was an obvious appeasement to users who just found out their CPUs were not upgradable to the newer, more powerful X models of the 3080 line. On the other hand, the $16,000 performance increase was so cheap it was basically a giveaway. That is, for about roughly the cost of the hardware and installation, users could get up to 6% more throughput out of their systems.

While it actually costs users more money, the the performance option can be viewed as a veiled price cut — especially in light of the cost of migrating to a larger model processor. Interestingly, that optional performance enhancement was not included in IBM's Aug. 28 price cut.

So why hold a fire sale after taking what appears to be great pains to hide the significance of recent price changes?

Perhaps it is impossible, even for IBM, to keep a major line of new mainframes a secret. Rumors of a late 1984 or early 1985 announcement of the so-called Sierra have been running rampant for at least a year. Back in 1981, the same thing happened with what was then being called the H series of processors. It is possible that IBM felt so many people expect the Sierra by year's end that it is pointless to pretend

See PRICES page 98

SYSTEMS & PERIPHERALS

DATA STORAGE

ALPHA DATA, INC.
Atlas Disk Drive

Alpha Data, Inc. has introduced its Atlas Disk Drive, said to have the capacity to store 160M bytes.

The Atlas Disk Drive also reportedly provides a total of 160 cylinders or 8,000 individual tracks. Its 50 read/write heads reportedly reduce arm movement and greatly reduce access time.

The Atlas Disk Drive also reportedly incorporates a sealed disk head chamber to permit the unit to work in difficult environments.

The Atlas Disk Drive is priced at $9,450.

Alpha Data, 20750 Marilla St., Chatsworth, Calif. 91311.

TERMINALS

MAPLE SYSTEMS, INC.
MAP-501 Industrial Terminal

Maple Systems, Inc. has announced the MAP-501 Industrial Terminal with either RS-232 or RS-422 interfaces to any Ascii-compatible computer or microprocessor-based control system.

The MAP-501 features a sealed membrane keyboard with a standard Ascii character set, 10 control keys and six user-definable function keys, for which the user can define a 14-Ascii-character string, the vendor said.

The display reportedly has two lines of 40 char. each, providing a one-line window into the 16-line by 80-char. memory buffer. The buffer is said to have a 1,280-char. memory.

The MAP-501 has two modes of operation, the conversational mode and the line-edit mode. In the conversational mode, each keystroke is transmitted to the host computer; the edit mode allows the user to enter or edit data in any line before transmission to the host, the company said.

The MAP-501 is priced at $825.

Maple Systems, 2615 W. Casino Road, Everett, Wash. 98204.

RACAL-MILGO, INC.
8000 Series

Racal-Milgo, Inc. has announced the Model 8015S and Model 8220S data terminals, based on the Intel Corp. 8085 microprocessor.

The Model 8015S uses the AT&T 8A1 protocol to send and receive asynchronous data at speeds up to 1,800 bit/sec and synchronous data at speeds up to 4,800 bit/sec, the vendor said. It features multiple format storage and eight pages of memory.

The Model 8220S uses Sperry Corp. protocol for synchronous transmission up to 9,600 bit/sec, according to the vendor. It features reverse video, low intensity, underline, blink and blank functions and bidirectional scrolling.

Both terminals provide one RS-232 port and one Centronics Data Computer Corp. printer port and are supported by Racal-Milgo printers ranging from 120 char./sec to 200 char./sec., the vendor said.

Each model costs $2,550.

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

PRINTERS/PLOTTERS

NICOLET ZETA CORP.
Plotter enhancement

Nicolet Zeta Corp. has announced that its Zeta 822/87 and Zeta 836/87 drafting plotters are now compatible with IBM cluster controllers.

The plotters can be ordered with a Nicolet-designed interface that connects to an IBM 3274 or 3276 cluster controller and can operate in IBM Systems Network Architecture/Synchronous Data Link Control and bisynchronous environments, the vendor said.

The plotters each cost $14,900.

Nicolet, 777 Arnold Drive, Martinez, Calif. 94553.

SOUTHERN SYSTEMS, INC.
RPC/S

Southern Systems, Inc. has announced RPC/S, an enhanced version of its Remote Printer Converter (RPC) said to allow remote printers

Floating Point, Honeywell offer interface

PORTLAND, Ore. — Floating Point Systems, Inc. (FPS) and Honeywell Information Systems, Inc. have announced a hardware/software interface, said to link the FPS-164 Scientific Computer with Honeywell's DPS 8/C mainframe operating under Honeywell's CP-6.

The interface was designed to give greater computational power to Honeywell users in scientific and engineering environments and also to provide them with access to third-party scientific and engineering applications that run on the FPS-164, Floating Point said.

The interface will be available during the fourth quarter of this year in Floating Point's System Job Executive mode, which supports processing on the FPS-164, and in Floating Point's Apex mode, which supports execution of CP-6 subroutines.

The one-time license fee for the interface is $6,000.

Floating Point Systems can be reached through P.O. Box 23489, Portland, Ore. 97223.

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Software News

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FTP Survey

to work as local output devices without requiring communications software.

Enhancements reportedly include higher speed electronics, improved firmware and better data compaction capability.

Features include an adapter for parallel-to-serial conversion at the host CPU site and a printer-mounted electronics board to convert serial to parallel for hard-copy output at the remote location, the vendor said. Data transmission is carried out in bit-compacted synchronous protocol with speeds to 19,200 bit/sec.

The RPC/S can drive line printers at 1,200 line/min and is compatible with a variety of impact printers, the vendor said. It is priced at $4,400.

Southern Systems, 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

AUXILIARY EQUIPMENT

CARDMATION CO.
CR300-30; RP8230

Cardmation Co. has announced the CR300-30 80-col. punched card reader and the RP8230 printing reader punch for the Hewlett-Packard Co. HP 3000 superminicomputer.

The CR300-30 card reader is a tabletop unit said to be capable of reading from 200 card/min to 600 card/min, the company said. The RP8230 printing card reader punch is said to punch and print cards at 45 to 75 card/min and read cards at 200 card/min, the company said.

HP 3000 users can use the Cardmation subsystems for short conversions and for longer term applications. The price to rent the CR300-30 reader is $360/mo, and the price to rent the RP8230 is $465/mo, the company said. Four-year rental rates are $180/mo for the CR300-30 and $235/mo for the RP8230.

The sale price for the CR300-30 card reader is $5,580, and the price for the RP8230 printing reader punch is $8,500, the company said.

Cardmation, P.O. Box 746, Frazer, Pa. 19355.

DEST CORP.
Workless Station Models 211, 212, 213

Dest Corp. has added three models to its Workless Station line of desktop document scanners. The models include a low-end unit and two scanners with proportional space recognition, as well as on-line recognition of up to 12 type styles, according to the vendor spokesman.

The Model 211, priced at $5,995, reads standard office documents at a rate of 25 sec/page. The Model 212, which retails for $7,995, also scans documents at a rate of 25 sec/page. In addition, the Model 212 reads justified text, proportional spacing and up to 12 common type styles. The Model 213, priced at $9,995, includes the same features as the Model 212, but scans at a rate of 15 sec/page.

Dest, 2380 Bering Drive, San Jose, Calif. 95131.

OMNILOGIC, INC.
Omni 4

Omnilogic, Inc. has announced Omni 4, a logic analyzer capable of timing, state and signature analysis.

The 27-lb product features menu-driven operation, which helps the user locate any technical problem, according to the vendor. Test parameters and data reportedly may be stored on a disk drive for off-line analysis.

In addition to its logic analyzer capabilities, Omni 4 is said to function as a microcomputer using Digital Research, Inc.'s CP/M operating system. The system features a Zilog, Inc. Z80A microprocessor operating at a speed of 4 MHz; 64K bytes of random-access memory; two double-sided, double-density disk drives; a 9-in. monitor; and 10 software packages. Also included are two RS-232C serial ports, a parallel port and an RJ11C modular telephone jack that attaches to a built-in, automatic answering and dialing, 300 bit/sec modem.

Omni 4 is priced at $4,495.

Omnilogic, 350 Sunset Blvd. N., Renton, Wash. 98055.

WILSON LABORATORIES, INC.
MWX-1000E Winchester Drive Analyzer

Wilson Laboratories, Inc. has announced the MWX-1000E Winchester Drive Analyzer, designed to test Winchester drives with the enhanced small disk interface (ESDI).

The MWX-1000E is a microprocessor-based analyzer that can be used with all 5¼-in. Winchester drives with the ESDI interface, according to the vendor. It supports the ESDI specification, including 5-MHz and 10-MHz data transfer rates, serial and parallel step modes and data strobe and track offset functions.

Testing can be conducted in three modes — automatic, semiautomatic and manual. Provisions are also made for logging test results through a serial printer port.

In the automatic mode, the MWX-1000E performs industry-standard checkout of the drive with information output through the RS-232 port to a printer, the vendor said. The semiautomatic mode allows the user to enter custom programs or modify standard ones via the keyboard. Manual-mode functions are initiated from the keyboard and are presented on the alphanumeric display.

The price of the MWX-1000E equipped to test drives with the ESDI interface is $8,250.

The same ESDI capability is also available in kit form for installation by the user in existing MWX-1000 analyzers currently testing ST506 interfaced drives. The price of the ESDI retrofit kit is $3,650.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

See **EXTRAS** page 90

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SYSTEMS & PERIPHERALS

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COMPUTER-LINK CORP.
Series 3000 Tape Cleaner/Evaluator

Computer-Link Corp. has announced the Series 3000 Tape Cleaner/Evaluator for magnetic tape and disk maintenance. The unit is said to offer preprogrammed and user-programmed modes, a CRT screen, a real-time clock, tridensity testing and a programmable keyboard in a security-controlled drawer.

The Series 3000 features three modes of operation: two preprogrammed modes, which provide preset error acceptance levels, tape and leader lengths, threshold testing levels and stripping relocation analysis; and a third, user-programmed mode that enables the operator to preselect all tape acceptance criteria and customize the unit, according to the vendor.

The product provides tridensity testing (800 bit/in., 1,600 bit/in. or 6,250 bit/in) and double cleaning before testing. It double-cleans before testing in the forward direction at 200 in./sec (IBM-compatible write/read) and automatically rewinds at 450 in./sec in a total cycle time of 3.5 min per 2,400-ft tape reel. In a clean-only mode, the unit operates both forward and reverse at 450 in./sec and a 2,400-ft tape reel can be cleaned in 2.2 minutes, the company said.

Version 1 of the Model 3800, featuring safety door, automatic packing arm, stop on end of tape, clean only, autoabort function, stop on footage, header label protection, permanent write error detection and stop on permanent write error detection, is priced at $16,500, the company said.

Verison 2 of the Model 3800, with all the above features plus a physical defects scanner, intensive clean test, autostrip relocate, gross error detection, stop on gross error and archival rewind, is priced at $18,000, the vendor said.

Computer-Link, 40 Ray Ave., Burlington, Mass. 01803.

SIMCO CO.
M30 Continuity Indicator

Simco Co. has announced the M30 Continuity Indicator, a multifunction testing device containing test and alarm functions. The device is said to ensure that static-protective workstations are safe from electrical interference.

The M30 tests conductive wrist straps on the operator to check for shorts or open circuits and proper resistance, the company said. The M30 is said to measure conductivity, and it checks for proper grounding of static-protective work surfaces and floor mats.

It also is said to monitor earth ground and electrical ground for continuity and low impedance and to detect damaging ac signals in excess of 5V.

An audible alarm and LEDs are used for clear test and alarm indications.

A +12 Vdc output signal is available for triggering a remote alarm or other shutdown or control function.

The M30 operates on 120 Vac and is designed for continuous operation.

The M30 Continuity Indicator is priced at $199.95, the vendor said.

Simco, 2257 N. Penn Road, Natfield, Pa. 19440.

SIMCO CO.
Static Dissipative Field Service Kit

Simco Co. has announced the Static Dissipative Field Service Kit, said to protect static-sensitive components from damage caused by electrostatic discharge during in-field servicing.

The kit includes a 24-in. by 24-in. static-dissipative grounded work surface mat and a conductive wrist strap.

The mat, connected to ground with a 10-ft coil cord, is said to dissipate static from any conductive object placed on it.

Two 11-in. by 11-in. pockets can be used to store static-sensitive boards while transporting to and from the field site.

The wrist strap is supplied with a 6-ft coil cord that plugs into the mat. The service kit is said to fold to 6 in. by 12 in. by ¾ in.

The kit is priced at $45, the vendor said.

Simco, 2257 N. Penn Road, Hatfield, Pa. 19440.

DATACOPY CORP.
Model 120, 130 interfaces

Datacopy Corp. has introduced direct interfaces between its Series 600 electronic digitizing cameras and graphic scanners and Digital Equipment Corp.'s PDP-11 (based on the Q-bus) and Intel Corp.'s Multibus minicomputers.

According to the vendor, each interface is a single printed-circuit board that includes software to program and control the scanner.

The Model 120 interface for the PDP-11 is a dual-size card supporting direct-memory access or direct program control data transfer.

The interface includes four I/O locations through which commands and data are transferred between the processor and the attached 600 series scanner, according to the vendor.

Driver software can be provided on DEC's RX-01/02 or RL-02 disks.

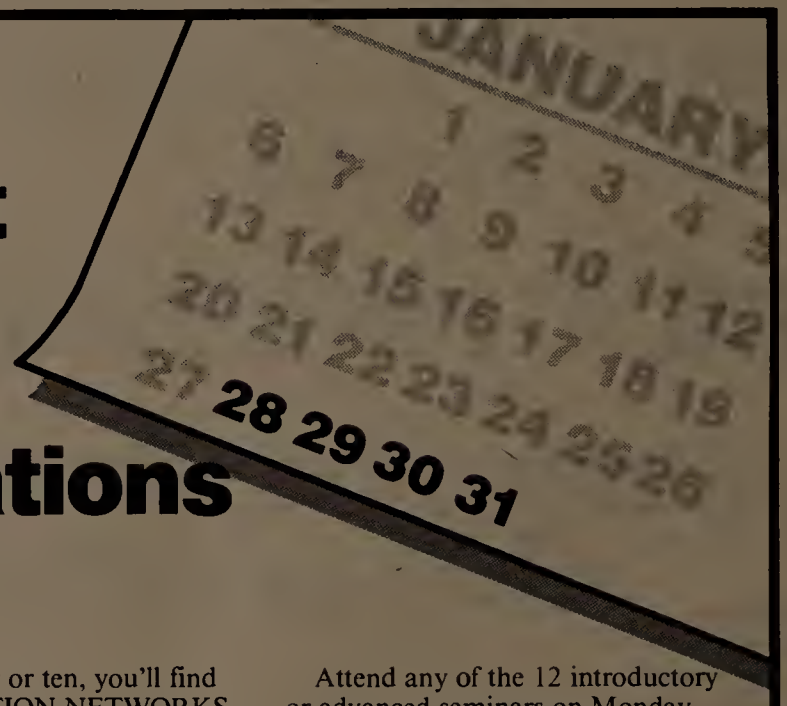
The Model 130 interface for Multibus processors meets the IEEE-768 bus standard. The interface is addressed as four memory locations. Control software runs under Unix.

The price of each interface is $1,495 in single quantities, with quantity discounts available, the vendor said.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

See **EXTRAS** page 92

The four most important days of the new year for telecommunications users!



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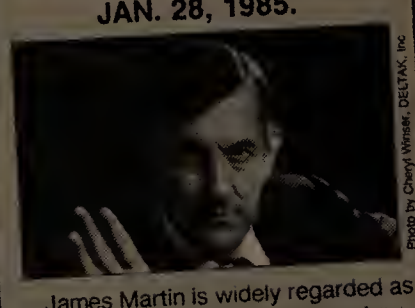
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SYSTEMS & PERIPHERALS

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SEIKO INSTRUMENTS U.S.A., INC.
CH-5201

Seiko Instruments U.S.A., Inc. has announced that the CH-5201 thermal image transfer hard copier for IBM 5080 Graphics System users has been enhanced with the company's Adaptable Video Interface (Avif).

The Avif is said to interface with a variety of color graphics terminals to the CH-5201, including IBM terminals. The CH-5201 produces 8½-in. by 11-in. copy on plain paper or polyester film for transparencies, the company said.

Resolutions of 150 dot/in. copies with as many as eight colors can be generated in less than one minute, the company said. The CH-5201 incorporates a local-frame buffer memory to store the image prior to generating actual output on paper. The buffer is also said to allow an image to be retained for up to 99 copies without operator attendance, the company said.

The CH-5201 uses a dry-ink sheet roll. The product costs $11,950 in single quantities and is available with a Centronics Data Computer Corp. interface, the vendor said.

Seiko, 1623 Buckeye Drive, Milpitas, Calif. 95035.

MASSCOMP CO.
SC-16F; TC-16F

Masscomp Co. has announced two optional I/O modules for its 32-bit, Unix-based MC-500 real-time data acquisition system.

The options, the SC-16F 16-channel, signal conditioning module and the TC-16F thermocouple input module, are aimed at laboratory research applications, the company said.

The modules are intended to operate under control of Masscomp's DA/CP, the MC-500 system's dedicated data acquisition control processor.

The SC-16F module is said to contain 16 independent, differential-input instrumentation amplifiers for use with low-level sources, current loop interfaces (0 to 20 mA or 0 to 50 mA) and bridge-type transducers. A 10V bridge excitation reference is also provided, the company said.

The TC-16F thermocouple input module contains 16 independent, differential-input instrumentation amplifiers for use with type J, K, S or T thermocouples, the company said.

Each module is priced at $2,500 in single quantities, the vendor said.

Masscomp, One Technology Park, Westford, Mass. 01886.

DATAPOWER, INC.
Qualifier

Datapower, Inc. has introduced a modular computer-based power supply testing system said to be programmable to handle 14 tests while simultaneously providing up to 10 programmable dc power loads to a single power supply under test.

Called the Qualifier, the unit consists of five load modules, ac source module, test and measurement interface module, an Apple Computer, Inc. Apple IIe microcomputer with two 5¼-in. drives and a dot matrix printer and software.

The Qualifier is said to cover a range of 14 power-supply parameters, including power-up, dc voltage output, line regulation, load regulation, combination line/load regulation, peak-to-peak output noise, current limit threshold, short-circuit current, overvoltage protection, cross-regulation, low-line detection, timing efficiency and supply voltage adjustment.

The load modules are available in three versions. Model A50 has a current range of 0 to 50A and a voltage range of 2 to 50 Vdc. A 650W output model, the B200, provides 0 to 200A and a voltage range of 2 to 50 Vdc. The Model C2.5 has a voltage range of 5 to 250 Vdc and a 0 to 2.5A range, the vendor said.

Price for the full Qualifier system is $19,950, but individual components can be purchased separately.

Datapower, 3328 W. First St., Santa Ana, Calif. 92703.

TELAUTOGRAPH CORP.
Omnifax SF3

Telautograph Corp. has introduced the Omnifax SF3-compatible business facsimile unit.

According to the company, the system has a store-and-forward sequential broadcast capability plus multiple

3270 STR

You have to think ahead a few moves to win the network game.



SYSTEMS & PERIPHERALS

transmission and polling functions.

The Omnifax SF3 has 1M byte of storage and allows users to store up to 33 letter-size pages of copy that can be sent to up to 99 stations.

A preprogrammed card allows users to transmit from memory, reportedly allowing frequently called stations to be grouped together. Five group cards are available, each with a 99-station capacity.

The SF3 is compatible with Group 2 and 3 and features a status-condition display. It has a 32-station dialer plus a capacity for 67 additional numbers abbreviated for two-digit key pad entry.

Price of the Omnifax is about $9,000. Additional features include autoreduction, wide-paper printing and a gray scale to reproduce photographs, the vendor said.

Telautograph, 8700 Bellanca Ave., Los Angeles, Calif. 90045.

HENRIKSEN DATA SYSTEMS, INC.
Credit Check III

Henriksen Data Systems, Inc. has introduced an automatic credit reporting device that is said to be compatible with many CRTs and microcomputers.

The Credit Check III is an intelligent memory device said to be capable of front-end processing for credit companies. It provides prompts for the user for data entry and field qualifications, disallowing many erroneous entries to the credit vendor's system, according to the vendor.

Credit Check III reportedly allows the user to enter data for five national credit bureaus in the same sequence. It automatically formats all information with the field identifiers, separators and logon requirements needed to access a report from one or more credit bureaus, the vendor said.

The device features autodialing and autologon to a credit company's computer. It will store up to 290 applications at one time, storing 32K bytes of memory, the vendor said.

The vendor said Credit Check III will function with any CRT and will interface directly with many microcomputers.

Price is $1,095.

Henriksen Data Systems, 12325 W. 52nd Ave., Wheat Ridge, Colo. 80033.

WILSON LABORATORIES, INC.
MBX-1000

Wilson Laboratories, Inc. has introduced a bus monitor/analyzer for Digital Equipment Corp.'s PDP-11 and LSI-11 minicomputers and other systems with similar bus characteristics.

The MBX-1000 bus monitor/analyzer is based on a Zilog, Inc. Z80 microprocessor and reportedly analyzes problems in DEC's software, hardware, buses, device controllers and system power supplies.

A dual-wide cable card plugs into the bus and connects to the MBX-1000. Random-access memory records bus cycles 1,024 samples deep by 72 bits wide. Analyses are displayed on the panel by a digital readout and LEDs.

An RS-232 port allows cross-country analysis or use of a computer as the control/display element.

According to the company, the MBX also has a talk mode for injecting signals onto the bus.

The monitor/analyzer comes in a rack-mountable version and in a portable carrying case.

Price of the MBX-1000 is $9,950, the vendor said.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

See **EXTRAS** page 94

A T E G I E S

Datastream can help you develop and implement a strategy that will lead to the 3270 network your company needs. We can show you how to utilize existing equipment (even hardware that is not mainframe compatible) to give more people in your company access to your network, without compromising security. And, we can show you how your network can grow without expensive cable or leased lines.



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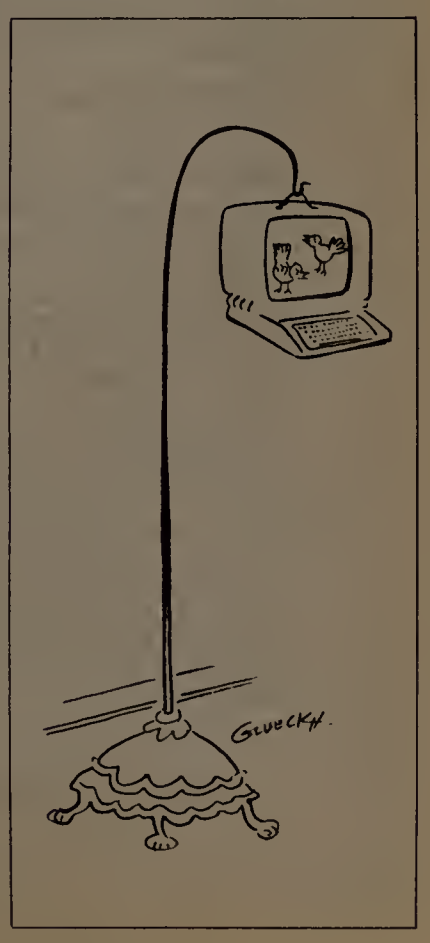
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2520 Mission College Blvd.
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(408) 986-8022

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DATASTREAM

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SYSTEMS & PERIPHERALS

EXTRAS from page 93

ILEX SYSTEMS, INC.
2000T series

Ilex Systems, Inc. has announced an optical page reader that reportedly was designed to meet U.S. Department of Defense radio wave interference (Tempest) security standards.

The 2000T can scan typewriter documents directly into a word processor, computer electronic mail system, paper tape punch or typewriter.

It is said to be capable of reading multiple typestyles and pitches within a page. It automatically selects up to eight document typestyles and comes equipped with an automatic document feeder.

The series has two models. The model 2020T has a throughput of 25 page/sec, while the model 2030T has a throughput of 15 page/sec.

Additional format processor options are available that reportedly can tailor the reader to the specific requirements of individual word processors.

Price for the 2020T is $20,950; the 2030T, $23,950.

Ilex Systems, Suite 110, 800 Charcot Ave., San Jose, Calif. 95131.

HEWLETT-PACKARD CO.
HP 3326A 2-channel synthesizer

Hewlett-Packard Co. has announced the 3326A 2-channel synthesizer, said to offer one instrument for applications requiring two sources from dc to 13 MHz in generating test signals.

The synthesizer is said to provide two independent signals related in phase or frequency or one combined complex signal. In the past, generation of test signals typically required two or more sources: an external combiner and a phase meter and/or a phase-lock system, the company said.

Two independent synthesizers, Channels A and B, are the core of the HP 3326A; each channel produces sine and square waves from dc to 13 MHz with independent control of amplitude and dc offset, the company said.

The HP 3326A provides programmable, calibrated and adjustable phase performance for one-, two- or multiphase signals, important for guidance and control systems, sonar transducers and receivers, phase-locked loops and phased array applications, the company said.

The 3326A is also said to produce rapid, sequential signals for dual-tone, multifrequency applications used in the design and testing of Touch-Tone telephone equipment, pocket pagers and mobile radios, the company said.

The price of the HP 3326A is $9,500, the company said. Option 001 — a high-stability frequency reference for improved frequency stability, especially for automatic test equipment applications — costs $650. Option 002 — high voltage for 40V amplitude range below 1 MHz — is $300, the company said.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

ILC DATA DEVICE CORP.
Bus-68010 1553 Bus Tester

ILC Data Device Corp. has announced the Bus-68010 1553 Bus Tester for testing and troubleshooting systems with U.S. Department of Defense data bus standard MIL-STD-1553.

The instrument is controlled by a front-panel, 24-pad keyboard and is monitored by a 16-char. alphanumeric LCD display.

It is is said to provide operation for bus controller, remote terminal unit or monitor simulation in laboratory and field applications.

Some of its features are said to include error generation and error detection.

All MIL-STD-1553 message formats can be simulated by the Bus-68010.

Its price is $2,995.

ILC Data Device, 105 Wilbur Place, Bohemia, N.Y. 11716.

LISP from page 87

not adversely affect the Iris multibus operation.

Lisp machines with either four Lisp microprocessors or two Lisp CPUs and one Motorola 68010 microprocessor and Unix, can interface with the Iris module.

The price of the Iris subsystem is $40,000, and deliveries will begin in the fourth quarter of this year.

More information is available from Lisp Machine, 6033 W. Century Blvd., Los Angeles, Calif. 90045.



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Soft-Switch is totally consistent with evolving standards for office systems. In fact, Soft-Switch integrates multi-vendor office environments by first translating a document into IBM's level 3 Document Content Architecture (DCA), and then into the exact format required by the receiving workstation.

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d IIIrd generation.

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R:BASE™
FROM MICRORIM®

SYSTEMS & PERIPHERALS

PRICES from page 87

the announcement is based only on consultants' fertile imaginations. Also, it is questionable whether bundling specific price cuts with a whole list of cuts, or hiding them in other products, actually fooled anyone.

Lastly, it is possible IBM is using the publicity and mystery surrounding the Sierra to its best advantage — to use uncertainty to sell off as many 3080 machines as possible.

For example, the price cuts sent out several clear messages to users:

■ Those who want to maintain the leading edge in IBM technology now know that it may be wise to wait a few months before buying a mainframe.

■ Users not interested in the latest and greatest IBM mainframe know that if they are interested in buying a 3080 series processor, now is the time IBM is willing to make a deal.

Sophisticated IBM users have been analyzing Big Blue's subtle moves for years and have been anticipating the Sierra announcement for months. The price cuts do serve as a passive admission by IBM that something is about to happen. They indicate IBM has moved into the final phases of getting the Sierra ready for announcement, and the top brass at IBM is reasonably sure that any significant bugs in the new system have been ironed out.

The uncertainty comes into play when you try and figure out what advantages and disadvantages the next line of IBM mainframes will hold for users. The new CPUs will undoubtedly offer more performance. It is a fair bet that the new systems will run only IBM's MVS/XA operating system. But will the data transfer rate be 3M or 6M byte/sec? And if 6M byte/sec turns out to be the big feature of the Sierra, what will that mean to users currently operating at 3M byte/sec?

Part of the Aug. 28 price cuts included 10% purchase price cuts on the 3380 and 3880 disk drive and controller. That action led some analysts to believe IBM is trying to sell off 3380 disk drives in lieu of a newer unit to be announced with the Sierra that supports a 6M byte/sec data transfer rate. Others speculated the pricing action was aimed principally at makers of 3380 competitors, who have finally reached reasonable production quantities on 3380-compatible products.

Some users may want to wait and see what the Sierra looks like before they commit themselves to buying one. That wait-and-see attitude could take at least a year. For example, once the machine is announced, it will take IBM four to six months to deliver a significant quantity of the Sierra processors. It will take another six months before users perform any serious tests to evaluate the new systems. Consequently, for some users, it may be worthwhile to hold on to an older 3080 processor until the uncertainty surrounding the Sierra has subsided.

The Goal News

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Allows operator to sign on at one terminal at a time	NO	
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WRIGHT from page 87

and taxi companies and individual motorists, Poole said. Distributors can allow motorists to use Wright Express, bank cards such as Visa or Mastercard, automated teller machine cards and oil company charge cards to access the system.

Poole said the Wright Express' negative data base is, in effect, a replacement for the "hot card" paper listings used by retailers. Using 2,400 bit/sec modems, the data center dials up the individual terminals to update daily the listings of stolen or restricted credit cards. The terminal also uploads a report of transactions conducted that day, including such data as odometer readings, so Wright Express can report monthly on each fleet vehicle's fuel economy.

When a customer enters his credit card or personal identification code, the terminal checks its data base to verify the card number.

Only when a motorist is using a card at a distributor's gas station away from his home area is the mainframe accessed via the terminal for verification from the central files, a process that takes 12 to 24 seconds, according to Poole. The system now uses 1,200 bit/sec modems, but will soon use 2,400 bit/sec communications when the new NCR mainframe is installed in Hartford.

William Moroney, president of the Electronic Funds Transfer Association (EFTA), a banking, retail and credit industry organization, said he knows of no comparable off-line authorization network. But, he added, "I'm not surprised to see somebody trying it, because everyone keeps moaning about the cost of telecommunications." He noted that, under federal regulations, even with such a system, creditors will need banks to settle accounts and transfer funds, so that Wright Express will not be in true competition with bank-run electronic funds transfer systems.

Speaking as an observer of the gasoline point-of-sale industry, Alfred Irato, president of Financial Card Systems, Inc. of Houston and a vice-chairman of the EFTA, said three obstacles for Wright Express to overcome will lie in convincing distributors to accept a new credit card, to convince them the card will bring them more business and to convince the consumer to carry a card. "People who try this type of thing always seem to underestimate the number of transactions they are going to need to make money and to overestimate the card absorption," Irato said.

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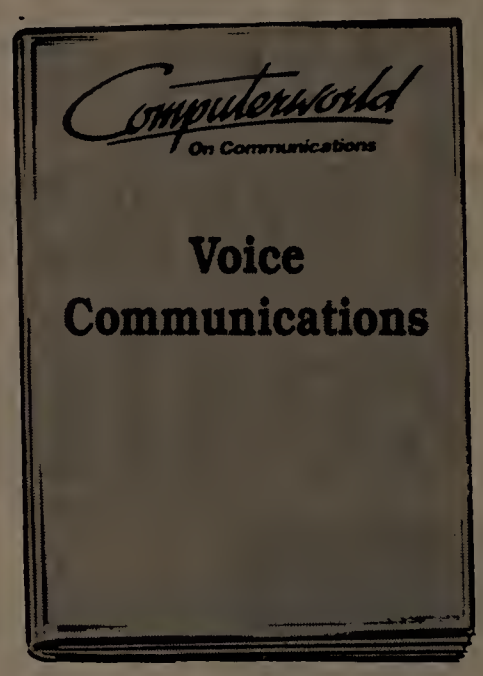
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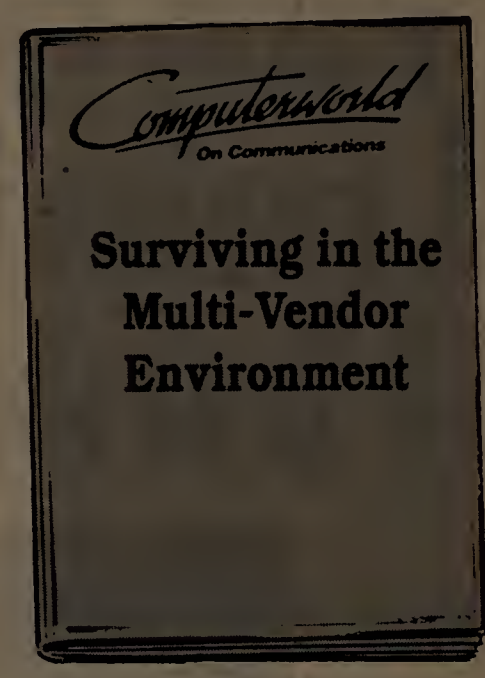
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November

Who uses digitized-voice store-and-forward systems? What's the latest on combining voice and data? Telephony has branched out into many sophisticated systems. We'll look at how voice communication is being integrated into the whole communications system.

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December

Almost a year after the AT&T breakup, users have been deluged by companies promising one-stop shopping. We'll look at the dominant vendors, offer guidance on selecting a vendor, and discuss the pros and cons of making a single-vendor commitment.

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MICROCOMPUTERS

Firms tailoring own software

By Paul Korzeniowski
CW Staff

Corporations are turning inward to solve a common dilemma in microcomputer software: General-purpose horizontal applications rarely meet the needs of various departments, yet few vertical applications are well designed. In many firms, in-house microcomputer support personnel are solving this problem with templates — software designed to increase the functionality of a popular horizontal application — and custom tailoring.

In one case, the Hartford Insurance Co. needed a budgeting package. "We [were] looking for an easy-to-use budgeting package so we could standardize information used by all our departments," said George Francis, lead analyst in the Hartford's microcomputer development center. "This [would] enable department managers to merge budgets and provide us with more accurate corporate information."

After searching in vain for a suitable package, the insurer decided to weave several available tools into a custom product. The key pieces in the package were Lotus Development Corp.'s 1-2-3 and DSS Development Corp.'s Optionware budgeting template. "The Optionware module gives us the flexibility [to write quickly] our own modules that take advantage of the functions of 1-2-3," Francis said.

Hartford's six-person micro support programming staff works much like its mainframe counterpart, tinkering with various products to meet end-user requirements. "We tailor approximately eight or nine different applications each month," Francis claimed.

Other corporations are following similar courses to meet their users' needs. Dr. G. M. Hughes, vice-president at Pfizer Pharmaceuticals, Inc. in New York, visits a department and determines how it functions before teaching personnel how to use a microcomputer package. After the visit, the personal computer support staff creates test cases tailored to the way the department works. "Without tailoring, the department may never use the product," according to Hughes.

Companies frequently turn to in-house tailoring out of necessity rather than choice. "We approached a number of vendors and hoped they would help us design an operating environment that would inte-

See **TAILOR** page 111

'Watson' debuts from Natural Microsystems

NATICK, Mass. — Natural Microsystems Corp. has introduced Watson, a telephone management subsystem claimed to turn the IBM Personal Computer into a "personal office automation workstation."

In addition to standard automated voice/data operations such as autodial and autologon, Watson provides voice mail, speech processing, calendar scheduling and other features, according to company President Charles Foskett.

Watson offers two varieties of multifunction operation, Foskett said. Context switching permits users to switch, with one keystroke, from Personal Computer applications to communications functions or back, while a time-sharing mode runs all applications concurrently.

The voice-handling features sharply distinguish Watson from competing products, Foskett said. "In its most rudimentary form, it's an answering machine," he said. At the next level of sophistication,

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Analysts question IBM's commitment to PC Xenix

SMALL TALK
Eric Bender
CW Senior Editor

The biggest surprise last month at IBM's launching of its Personal Computer AT was the micro's ability to wear three hats at the same time, acting either as the Ferrari of single-user workstations, as a local-area network file server or as a multiuser system running IBM PC Xenix (the Microsoft Corp. version of AT&T's Unix). But that third option puzzles many observers, who say that IBM is pushing the Xenix configuration only half-heartedly.

IBM's PC Xenix introduction was "the starting gun" for large-business sales of multiuser microcomputer systems, said Everett Meserve, a senior analyst with Arthur D. Little, Inc., in Cambridge, Mass. "The race is on."

Meserve agreed that if the multiuser version of the AT was aimed at small business sales, IBM would offer software as part of a complete package, and such products have not been announced. Other analysts added that IBM may move only cautiously into the small business multiuser micro arena, a fragmented, hotly contested battleground in which IBM lacks some of its customary bone-crushing advantages.

But regardless of where PC Xenix is aimed, it will arrive in the first quarter of 1985 supporting only three users, and IBM spokesmen have not disclosed any intention to make it play on the new IBM PC Network.

Competing vendors from Digital Equipment Corp. down to back-of-the-garage outfits gleefully point out that many multiuser micros support well over three users, often at a cheaper price per user, and currently offer a considerable selection of software.

The AT's software drought will be temporary, as many applications are likely to be ported over from other machines running Xenix. The three-user barrier is a trickier subject, however. Some experts maintain that the three-user barrier was imposed artificially, pointing out that other systems built around the Intel Corp. 80286 processor far exceed that limit.

"The chip can support far more than

See **XENIX** page 111

Zilog introduces Unix-based multiuser computer systems

By Kathleen Sullivan
CW West Coast Bureau

CAMPBELL, Calif. — Zilog General Systems Division of Zilog, Inc. last week introduced a family of Unix-based multiuser computer systems, unveiling three models which the company said offer a "significant leap in performance" over its existing product line.

Zilog's System 8000 Series Two, which replaces the Series 8000 Plus, features the company's 16-bit Z8001B microprocessor, which runs at 11.1 MHz, approximately twice the speed of the microprocessor in previous System 8000 models, the company said.

In addition, each CPU in the Series Two line includes 32K bytes of onboard cache memory, designed to reduce memory access time. The Series Two models also include a Unix license for eight users, one disk and a cartridge tape as standard features, according to the vendor.

The Series Two line is made up of three models — Models 12, 22 and 32. The Model 12, which can support up to 16 users, will be available in October at a base price of $19,950. It includes 512K bytes of main memory, which can be expanded to 2M bytes, and a 5¼-in., 52M-byte Winchester disk drive. A second drive can be added for a total of 104M bytes of storage.

The Models 22 and 32, both available immediately, can support up to 40 users. The Model 22, whose base price is $23,950, comes with 512K bytes of memory, which can be expanded to 4M bytes. The Model 22 includes a cartridge tape and a 5¼-in., 52M-byte Winchester drive. The system can be expanded to include four Winchester drives, for a total storage of 208M bytes.

The company described the Model 32 as the flagship of the Series Two line of computers. For a base price of $29,950, the system includes 512K bytes of memory that can be expanded to 4M bytes and an 8-in. Storage Module Drive with a capacity of 168M bytes. The Model 32 can accommodate a total of four drives, for a total storage of 672M bytes.

Optional features for the Models 22 and 32 include Zilog's floating-point processor and a ½-in. streaming nine-track tape. An ICP 8/02 intelligent communications processor is optional on all System 8000 models, the vendor said.

Zilog's Series Two systems, which run AT&T's Unix System III operating system, are software-compatible with previous Zilog systems, the company said.

With the introduction of the Series Two, Zilog announced it would discontinue production of two models in its System 8000 Plus series, the 22 and 32 Plus models, which will only be available for the next 60 to 90 days.

The company will continue to offer two entry-level systems, the Model 11 and the Model 11 Plus.

Zilog will offer its Series Plus customers the ability to upgrade to the Series Two line, but the cost of the upgrade has not yet been set.

Additional information may be obtained from Zilog, which is located at 1315 Dell Ave., Campbell, Calif. 95008.

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STRATEGIC SOFTWARE PLANNING CORP.
Promis

Strategic Software Planning Corp. has introduced Project Management Integrated System (Promis) software, a project management system that draws Critical Path Method (CPM) network diagrams and offers other features.

Promis, for the IBM Personal Computer XT, provides aid with project planning, tracking, resource management and cost control and provides reports and graphics functions, the vendor said. It offers the ability to replace variables in a project plan to see how they will affect timetables and costs.

Promis reportedly uses a data base architecture and can handle 800 activities per CPM network. Its number of projects reportedly is limited only by user memory.

Promis is priced at $3,000.

Strategic Software Planning, 222 Third St., Cambridge, Mass. 02142.

CYTROL, INC.
Cylock

Cytrol, Inc. has introduced Cylock PC, a security system for the IBM Personal Computer and Personal Computer XT.

Cylock PC reportedly prevents unauthorized access to protected Personal Computers and allows authorized users to encrypt and control data files for private or shared use. The product also produces a security audit trail, the vendor said.

Cylock PC reportedly consists of an expansion board, an external key receptacle, the Datakey memory device, Cylock software and documentation. To access a Cylock PC-protected Personal Computer, users must insert a Datakey and enter a corresponding password.

Cylock PC is priced at $449.

Cytrol, 4620 W. 77th St., Edina, Minn. 55435.

KEN ORR & ASSOCIATES, INC.
Structure(s)/PC Workstation

Ken Orr & Associates, Inc. has introduced Structure(s)/PC Workstation, a development system for design and generation of Cobol programs on the IBM Personal Computer XT and Personal Computer AT.

The workstations are said to include three of the firm's software products: Structure(s)/PC, a structured design documentation package; Structure(s) Cobol Code Generator; and Menu(s)/PC, a menu-building package. Also included are MBP Software and Systems Technology, Inc.'s MBP Cobol compiler with sort and screen design utilities and SDI, Inc.'s Stoplock security system.

The software permits system, data base and program documentation design, the vendor said. A Personal Computer with 256K bytes of memory, one short expansion slot and a hard-disk storage unit is required.

Structure(s)/PC Workstation is priced at $1,995.

Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

DEERESOFT, INC.
Magic Menu

Deeresoft, Inc. has introduced Magic Menu software, which provides a menu system for control of the IBM Personal Computer or Personal Computer XT.

Magic Menu reportedly includes an editor, written in assembly language. Included also are installation batch files and a sample menu system, Deeresoft said. Magic Menu's menus, normally disk-resident, can have their definitions designated memory-resident during system operation, according to the vendor.

Magic Menu requires PC-DOS 2.0 or later versions of that operating system, a minimum of 128K bytes of memory, two diskette drives or a fixed disk and a diskette drive.

Magic Menu is priced at $99.

Deeresoft, P.O. Box 1360, Melbourne, Fla. 32901.

PALANTIR SOFTWARE
Mactype

Palantir Software has introduced Mactype, an interactive tutorial for touch-typing instruction on the Apple Computer, Inc. Macintosh microcomputer.

Mactype reportedly teaches touch typing for the Qwerty, Dvorak and Extended Character Set keyboards. It also teaches beginning students basic keyboard layout and typing skills, according

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to the vendor. For intermediate students, it is said to offer improvements in accuracy and, for the advanced, improvements in speed.

Mactype reportedly is self-paced, with prompts for testing when specific achievement levels are reached.

Mactype is priced at $49.95, according to the vendor.

Palantir Software, Suite 110, 7701 Wilshire Place Drive, Houston, Texas 77040.

FUTURENET CORP.
Dash-2 schematic designer

Futurenet Corp. has introduced its Dash-2 schematic designer for the IBM Personal Computer and Personal Computer XT.

The Dash-2 software reportedly includes mouse-driven editing features, as well as a graphics controller and mouse interface. It reportedly increases the speed and ease of creating logic and chip-level designs and is able to create files that are compatible with those of the company's Dash-1 product.

Dash-2's capabilities reportedly include "Tag and Drag," which enables Dash-2 to pick a symbol or drawing area and drag it across the screen while maintaining corrections. Dash-2 is also said to feature autopan, which automatically pans the screen when the cursor reaches the screen's edge, and area definition via a mouse, which permits the mouse to locate any two opposite corners of a desired area.

Dash-2 is priced at $5,980 for the Personal Computer and $6,280 for the Personal Computer XT.

Futurenet, 6709 Independence Ave., Canoga Park, Calif. 91303.

BNA SOFTWARE
Income Tax Spreadsheet

BNA Software, a division of the U.S. Bureau of National Affairs, has introduced the first of a series of tax software programs for professional tax advisers using the IBM Personal Computer or compatible machines.

The Income Tax Spreadsheet incorporates the 1984 tax law changes and is designed to reduce income tax computation time.

The program uses an electronic spreadsheet format and multilevel worksheets and incorporates automatic calculation of net tax liability over a seven-year period for all categories of individuals and fiduciaries.

Multiple-year or multiple-case projections can be performed simultaneously, and variables can be changed with recalculation of tax liability.

The program costs $495.

BNA Software, 1231 25th St. N.W., Washington, D.C. 20037.

TOUCH TECHNOLOGIES, INC.
PC Menu

Touch Technologies, Inc. has introduced its PC Menu software, said to allow the user to develop custom menu systems for the IBM Personal Computer and Personal Computer XT.

PC Menu permits users to create Help screens to assist casual users and to place programs under menu control without dealing with IBM's PC-DOS commands or program names, according to the vendor.

PC Menu requires a 10M-byte hard disk. It is priced at $139.95.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

DATAWORKS CORP.
MRP package

Dataworks Corp. has introduced its Manufacturing Resource Planning (MRP) package for the IBM Personal Computer AT and Personal Computer XT.

The MRP package consists of several modules, all running under the Pick operating system from Pick and Associates, Inc, the vendor said.

The 11 modules of the MRP package include Manufacturing Resource Planning, Bill of Material, Inventory Control, Purchasing/Receiving, Work Order/Labor, Sales Order/Marketing, Accounts Receivable, Accounts Payable, General Ledger, Fixed Assets and Payroll, according to the vendor.

The software, orginally developed for the IBM Series/1 minicomputer, reportedly allows each module to work with the entire line or stand alone.

The MRP package is priced at $17,500, according to the vendor.

Dataworks, 5752 Oberlin Drive, San Diego, Calif. 92121.

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☐ Cincinnati, OH:	Tuesday, October 16	☐ Detroit, MI:	Tuesday, October 30
☐ Anaheim, CA:	Tuesday, October 16	☐ Dallas, TX:	Tuesday, October 30
☐ Philadelphia, PA:	Thursday, October 18	☐ Stamford, CT:	Thursday, November 1
☐ Denver, CO:	Thursday, October 18	☐ Parsippany, NJ:	Thursday, November 8
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COMMUNICATIONS

BUSINESS RESEARCH CORP.
Investext/PC-Link

Business Research Corp. has announced Investext/PC-Link, a communications package for the IBM Personal Computer.

The package automatically connects a user to a telecommunications network and logs on to Investext, Business Research Corp.'s electronic library, the vendor said. Investext reportedly contains 70,000 pages of research from 31 banking and financial research firms.

Investext/PC-Link allows a user to download data base information to disk in IBM PC-DOS operating system format, according to the vendor. Files reportedly can be combined with previously created documents or spreadsheet models to create customized analytical reports.

Investext/PC-Link costs $149, which includes $100 credit toward Investext. Without the credit, the product costs $99.

Business Research, 1660 Soldiers Field Road, Boston, Mass. 02135.

MULTI-TECH SYSTEMS, INC.
Multimodem PC

Multi-Tech Systems, Inc. has introduced Multimodem PC, which includes the latest release of Multicom PC communications software, for the IBM Personal Computer.

Multimodem PC, a single-board card that fits inside the IBM Personal Computer and requires one serial interface card, offers autodial and autoanswer communications at 300 or 1,200 bit/sec, according to the vendor.

Multicom 1.2, only available bundled with Multimodem PC, reportedly includes such enhancements as a Help command offering page number references for the owner's manual and the potential to be modified by users. The package also offers unattended operation in its batch mode and an expanded set of macro commands for automatic logon or use in batch mode, the vendor said.

Multicom PC is priced at $549.

Multi-Tech Systems, 82 Second Ave. S.E., New Brighton, Minn. 55112.

PROMETHEUS PRODUCTS, INC.
Promodem 1200 Macpac

Prometheus Products, Inc. has introduced its Promodem 1200 Macpac for the Apple Computer, Inc. Macintosh microcomputer.

The Promodem 1200 Macpac is said to be compatible with Hayes Microcomputer Products, Inc.-compatible systems and can communicate at either 300 or 1,200 bit/sec. It is said to have a built-in clock/calendar.

The product reportedly includes a modem-to-Macintosh connecting cable; Procom-M software; an instruction manual; and a telephone cord. The Procom-M software terminal program utilizes the Macintosh's windowing capabilities, according to the vendor.

The modem reportedly includes the ability to use an optional buffer memory card that offers 2K bytes of battery-backed-up Cmos memory to protect time, date and operating parameters.

Promodem 1200 Macpac is priced at $549. The buffer card is priced at $99.

Prometheus Products, 45277 Fremont Blvd., Fremont, Calif. 94538.

INTELLIGENT TECHNOLOGIES INTERNATIONAL CORP.
Bisync Exchange 3780, 3270

Intelligent Technologies International Corp. has introduced its Bisync Exchange 3780 and 3270 series of emulation products for the IBM Personal Computer, Personal Computer XT and compatibles.

Bisync Exchange 3780 reportedly enables a Personal Computer to emulate an IBM 3780 or 2780 terminal for two-way information communication. It is also said to permit communication between Personal Computers at up to 4,800 bit/sec over voice-grade or leased lines.

Bisync Exchange 3270 enables a Personal Computer to emulate an IBM 3274/6 cluster controller, an IBM 3278/9 terminal and an IBM 3287 printer, the vendor said.

The Bisync Exchange 3780's capability for 4,800 bit/sec transmission between Personal Computers means that users can transmit at a rate of more than one page/sec, according to Intelligent Technologies. An automatic error recovery feature reportedly protects against errors.

The Bisync Exchange 3780 is priced at $695; the 3270 at $795.

Intelligent Technologies International, 151 University Ave., Palo Alto, Calif. 94301.

FOX RESEARCH, INC.
10-Net 2.0

Fox Research, Inc. has announced that its 10-Net local-area network runs on the IBM Personal Computer AT.

Fox said 10-Net 2.0 has been tested and is certified to run under IBM's PC-DOS 3.0, which is used on the Personal Computer AT.

10-Net 2.0 includes a circuit board that plugs into the bus slot on the Personal Computer AT and attaches through twisted-pair wire to the 10-Net card on the network, according to the vendor. Coupled with 10-Net software, the product provides record locking and security functions.

10-Net 2.0 includes Chat, an electronic mail facility, and CB, which allows several users to share the same channel in a fashion similar to CB radios.

10-Net 2.0 consists of circuit board, tap box, software, cable and documentation. It costs $695.

Fox Research, 7005 Corporate Way, Dayton, Ohio 45459.



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STORAGE

EMERALD SYSTEMS CORP.
PS series

Emerald Systems Corp. has introduced its PS series of hard disk expansion subsystems. The series reportedly offers ¼-in. or ½-in., nine-track backup for the IBM Personal Computer, Personal Computer XT, Personal Computer XT/370 and Personal Computer AT.

The expansion systems are available in capacities of 40M, 65M, 140M and 280M bytes and can overcome the Personal Computer's expansion restrictions to allow processing of files larger than 32M bytes, Emerald said.

Also included are utilities for downloading mainframe data to the Personal Computer and user-configurable disk caching of up to 512K bytes.

The subsystems are said to be packaged in IBM look-alike enclosures with six expansion slots.

The 40M-byte system is priced at $4,350; the 65M-byte unit at $5,850; the 140M-byte system at $8,850; and the 280M-byte system at $15,850.

Emerald Systems, 4901 Morena Blvd., San Diego, Calif. 92117.

PERSONAL MICRO COMPUTERS, INC.
Micromate extension

Personal Micro Computers, Inc. has introduced a hard disk extension for its Micromate microcomputer. The 10M-byte hard disk drive reportedly is expandable to 20M bytes.

The 10M-byte storage unit reportedly uses a Shugart Corp. half-height drive and its own power supply with transient protection. It can transfer data to the computer at a rate of 5M byte/sec, according to the vendor.

The 10M-byte expansion unit for the storage unit reportedly contains a 10M-byte drive, but no controller.

The 10M-byte drive is priced at $1,795; the expansion unit at $1,295.

Personal Micro Computers, 275 Santa Ana Court, Sunnyvale, Calif. 94086.

TOSHIBA AMERICA, INC.
ND-04D disk drive

Toshiba America, Inc.'s Information Systems Division has introduced a 5¼-in. floppy disk drive said to be compatible with the IBM Personal Computer and the IBM Personal Computer XT.

It is said to have an 80-track, 360K-byte double-density recording capacity.

The drive has a data transfer rate of 250 bit/sec. The half-high configurations allow the user to slip two drives into the IBM XT.

It costs $375.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.

EICON RESEARCH, INC.
Tera-drive

Eicon Research, Inc. has announced Tera-drive, a 5¼-in. floppy disk subsystem for Apple Computer, Inc.'s Apple IIe.

Tera-drive reportedly features a 62.5K byte/sec data transfer rate and 2M bytes of files space on dual 3.2M-byte unformatted slim drives.

The drive comes with Eicon's operating system, which supports Apple's Apple-DOS, Digital Research, Inc.'s CP/M and Softech Microsystems, Inc.'s UCSD-P operating systems.

Tera-drive is said to feature automatic dating, optional tagging and an extended file size of 1M byte for Apple-DOS.

A 1M-byte Tera-drive costs $995, while a 2M-byte drive sells for $1,595.

Eicon Research, PH 520 Fifth Ave., New York, N.Y. 10036.

PRINTERS/ PLOTTERS/ PERIPHERALS

HANZON DATA, INC.
Model 12319 Universal Card

Hanzon Data, Inc. has introduced an intelligent serial interface card that reportedly allows Epson America, Inc. printers to replace Apple Computer, Inc. Apple Image Writer printers.

According to the vendor, the Hanzon Model 12319 Universal Card operates in two modes, passing all data without modifications or checking incoming data for the control codes used with the Image Writer and converting it to equivalent codes for Epson printers.

The Universal Card is also said to support the full range of RS-232 serial interface protocols. It provides hardware handshaking and two types of software handshaking.

Data transfer rates reportedly can be set from 300 to 19.2K bit/sec with either seven- or eight-bit data. An on-board 2K-byte memory buffer expandable to 16K bytes is also included.

Its price is $129.50.

Hanson Data, 18732 142 Ave. N.E., Woodinville, Wash. 98072.

AMDEK CORP.
5025 Printer

Amdek Corp. has introduced its 5025 Printer, a letter-quality unit offered in 2K-byte and 8K-byte buffered versions. It reportedly operates at 25 char./sec.

The 5025 reportedly offers either RS-232 or Centronics Data Computer Corp. parallel interfaces and a variety of typefaces on daisywheels. It also offers adjustable character spacing.

The Amdek 5025 comes with a one-year warranty, parallel interface cable, ribbon cassette cartridge, a print wheel and paper guide.

The 5025 is priced at $899.

Amdek, 2201 Lively Blvd., Elk Grove, Ill. 60007.

SUMICOM, INC.
1120 Printer

Sumicom, Inc. has introduced its 1120 Printer, an 18 char./sec daisywheel unit compatible with personal computers from IBM, Apple Computer, Inc. and other manufacturers.

The 1120 reportedly includes an 8-bit Centronics Data Computer Corp. parallel interface and offers an RS-232 serial interface as an option. It uses Qume Corp. print wheels and ribbon cartridges, according to Sumicom.

The printer is said to provide proportional spacing, accept paper up to 13-in. wide and weigh 21 lb. It offers unidirectional, incremental printing and bidirectional, logic-seek printing on the basis of the software selected, the vendor said.

The 1120 is priced at $495.

Sumicom, 17862 E. 17th St., Tustin, Calif. 92680.

EPSON AMERICA, INC.
Lettertype

Epson America, Inc. has introduced Lettertype, a board that transforms Epson's FX-80, FX-100 and JX-80 dot matrix printers into near-letter-quality printers.

Lettertype includes a 6K-byte buffer and allows the user to print in either draft or near-letter-quality mode, Epson said.

Continued on page 108

MVS/XA, MVS, VSI users

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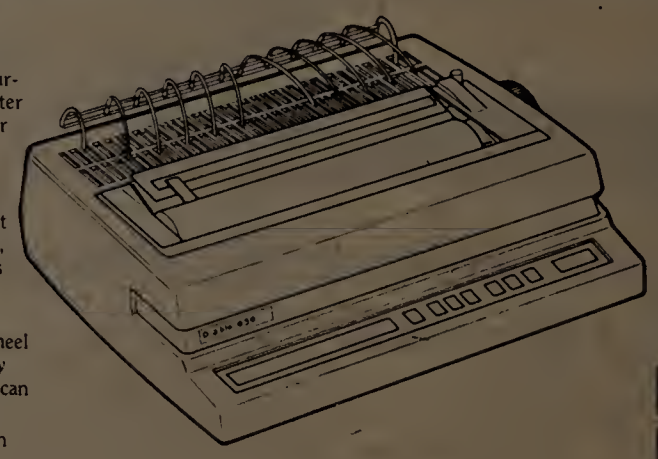
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MICROCOMPUTERS

Continued from page 106

Printers are said to operate at a speed of 32 char./sec in near-letter-quality mode and to work at a speed of 160 char./sec in draft mode.

Lettertype costs $199 and can be installed by a user.

Epson America, 3415 Kashiwa St., Torrance, Calif. 90505.

FACIT, INC.
4511 dot matrix printer

Facit, Inc. has introduced its 4511 dot matrix printer, an 80-col. printer said to offer compatibility with the IBM Personal Computer and Epson America, Inc. microcomputers.

The 4511 printer offers parallel Centronics Data Computer Corp. and RS-232C serial interfaces, the vendor said. The product reportedly can print draft copy at 158 char./sec in a 9- by 9-in. matrix and, in double-pass mode, produce nearly letter-quality printing at 40 char./sec.

The 4511 can print characters twice the normal height and width, as well as italic, bold face, micro, sub and superscript characters, Facit said. Block and pin graphics reportedly can also be printed.

The 4511 is priced at $650 and will be available in the fourth quarter of this year, the vendor said.

Facit, 235 Main Dunstable Road, Nashua, N.H. 03061.

AMDEK CORP.
Color 500 monitor

Amdek Corp. has announced the Amdek Color 500 monitor for displaying graphics or text from personal computers with National Television Standards Code (NTSC) or red-green-blue (RGB) video outputs.

The product features a resolution of 460 pixels by 240 lines in the RGB mode and 320 pixels by 240 lines in the NTSC composite mode, the company said. In the RGB mode, a switchable color matrix is said to allow the Color 500 to provide the full 16 IBM or Apple Computer, Inc. colors.

The Color 500 is said to provide up to 80 columns by 25 lines in the RGB mode, or 64 columns by 25 lines in the NTSC mode.

The price of the Color 500 is $525, according to the vendor spokesman.

Amdek, 2201 Lively Blvd., Elk Grove Village, Ill. 60007.

BOARD-LEVEL DEVICES

DATACUBE, INC.
IVG-128

Datacube, Inc. has announced its IVG-128 board, which is said to provide a full frame of digital video storage at a resolution of 384 horizontal by 512 vertical by 8 bit/pixel for use on the IBM Personal Computer.

Input and output video translation tables are said to provide 16 million pseudocolors and input processing in real time.

Bit plane write protection is provided, and an optional full-color (red, green and blue) configuration is also offered, a vendor spokesman said.

Price for the IVG-128 is $2,995, the vendor said.

Datacube, 4 Dearborn Road, Peabody, Mass. 01960.

COMPUTER PACKAGING TECHNOLOGY, INC.
Overdrive

Computer Packaging Technology, Inc. has introduced Overdrive, an add-on module that allows an IBM Personal Computer to drive a 16-user system.

According to the vendor, Overdrive is available in two versions. A module fits either into the IBM Personal Computer expansion slot or into a Computer Packaging Technology expansion chassis, which contains four to 16 modules. Each module drives one terminal.

A single-user module costs $1,495; a chassis with four user modules is priced at $4,995, a spokesman for the vendor said.

Computer Packaging Technology, P.O. Box 129, Mohegan Lake, N.Y. 10547.

CMC INTERNATIONAL, INC.
Concurrent PC Dial/Log

CMC International, Inc. has upgraded its PC Dial/Log expansion board for voice mail to allow for concurrent applications on the IBM Personal Computer.

While the firm's PC Dial/Log remains on-line throughout the voice mail process, Concurrent PC Dial/Log reportedly permits voice mail and another application to



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MICROCOMPUTERS

run at the same time.

Like PC Dial/Log, the product offers phone answering, voice message distribution and message forwarding, the vendor said.

It sells for $695.

CMC International, 1720-130th Ave. N.E., Bellevue, Wash. 98005.

VERTEX SYSTEMS, INC.
Apple-Turnover

Vertex Systems, Inc. has introduced Apple-Turnover, a board for the IBM Personal Computer which reportedly allows the direct transfer of files between Apple Computer, Inc.'s Apple II, II+ and IIe diskettes and IBM diskettes.

Apple-Turnover reportedly is menu-driven and allows individual Apple or IBM diskette files, or an entire diskette, to be copied.

According to the vendor spokesman, blank diskettes can be initialized with the IBM for the Apple. Serial-file transfers and modems reportedly are not needed.

Apple-Turnover is said to consist of a half-size printed-circuit board, a disk drive attachment cable, file-transfer software and a test disk. The system requires 128K bytes of memory and two diskette drives and supports most Personal Computer-based hard disk systems.

Apple-Turnover is priced at $279.50

Vertex Systems, Suite 3, 6022 W. Pico Blvd., Los Angeles, Calif. 90035.

IE SYSTEMS, INC.
Acculink Version 2.5

IE Systems, Inc. has announced a new version of its asynchronous communications package designed for a variety of 16-bit microcomputers, including the IBM Personal Computer.

Acculink Version 2.5 is said to feature emulation modules for Digital Equipment Corp.'s VT100 and VT52 terminals and IBM's 3101-C terminals, as well as disk and file utilities that allow users to perform disk file maintenance, a spokesman for the vendor said.

Acculink Version 2.5 sells for $245.

IE Systems, P.O. Box 359, Newmarket, N.H. 03857.

GRAFPOINT
Tgraf-05

Grafpoint has introduced a mainframe-to-microcomputer communications program that is said to provide Tektronix, Inc. 4105 terminal emulation for IBM Personal Computers and compatible microcomputers.

With Tgraf-05, a Personal Computer or compatible can access both alphanumeric and graphics applications software running on larger computers.

As an alphanumeric terminal, it is said to allow a Personal Computer to act as a Digital Equipment Corp. VT52 terminal. In a graphics mode, it provides emulation to the Tektronix 4105.

Tgraf-05 will run on any Personal Computer or com-

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PHONE from page 101

Watson can act as a voice-mail system for multiple users, complete with security features, he said.

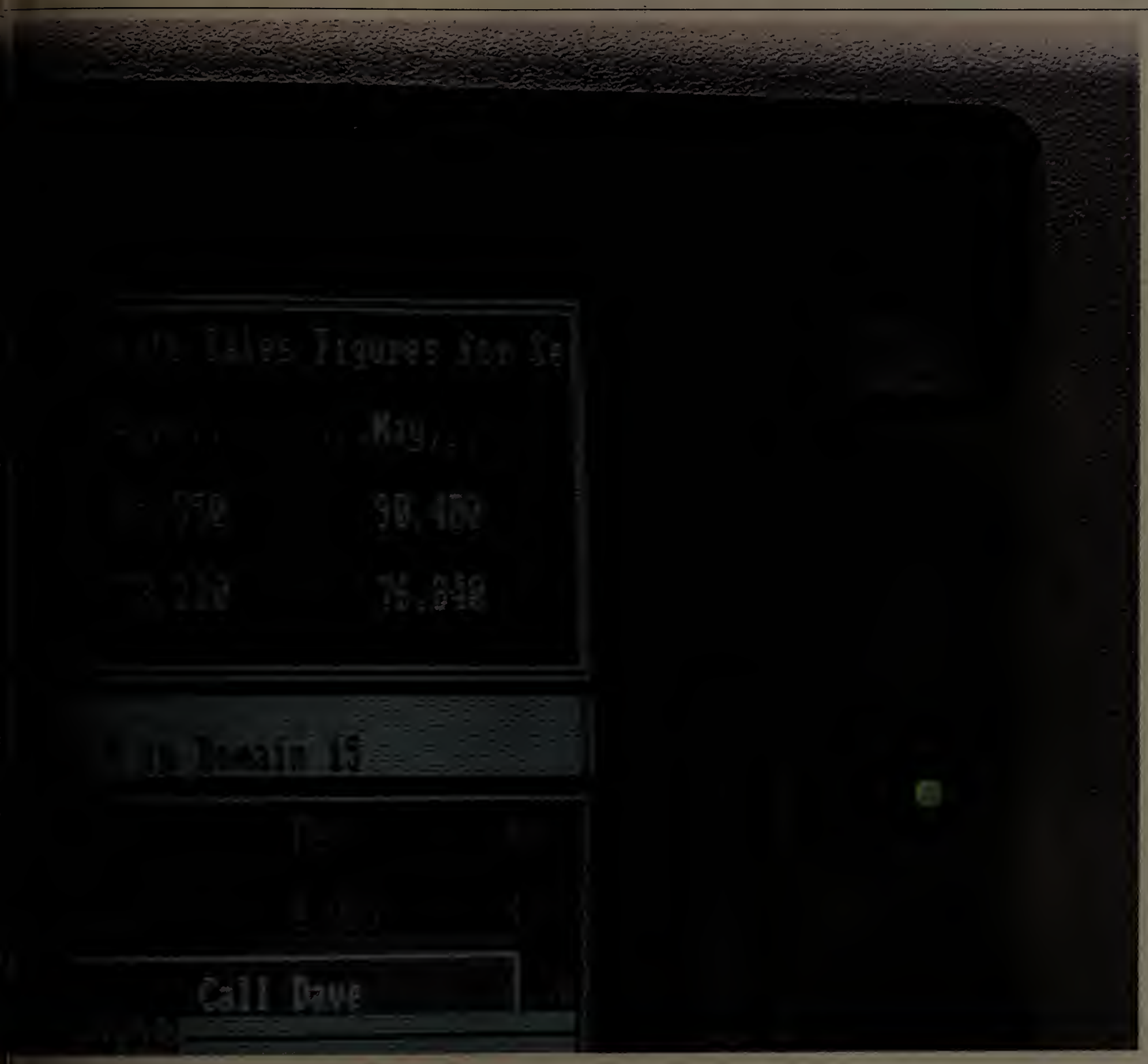
The system can be reached from an internal phone or through any external Touch-Tone phone. It includes some limited speech synthesis for common words (such as dates and numbers) used in outgoing voice mail, Foskett said. In addition, speech processing allows users to edit their voice-mail messages or dictation verbally, he explained.

Watson compresses, stores and reproduces speech at either 32K bit/sec ("with almost perfect speech") or 12K bit/sec, Foskett said. In the 12K bit/sec mode, 30 minutes of speech can be stored in 2.5M bytes.

Watson will be targeted initially at professionals in small, service-oriented businesses, such as lawyers, accountants, brokers and consultants, Foskett indicated. "Their time has a high value and their business is communications-intensive," he noted. "Watson will save them time and also provide increased accuracy of communications — they won't miss messages and they'll understand the complete message.

Watson connects to a standard desktop telephone and consists of a hardware board (with modem) and operating software, including a terminal emulation package. Price for a version with a 300 bit/sec modem is $849, while a model with a 1,200 bit/sec modem will cost $998.

Natural Microsystems is located at 6 Mercer Road, Natick, Mass. 01760.



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WYSE

Continued from page 109

patible with a minimum of 128K bytes of memory and the IBM DOS 2.0 operating system or higher. Asynchronous communication is provided via any standard COM1 port.

Its cost is $395.

Grafpoint, 866 Lily Ave., Cupertino, Calif. 95014.

NETWORK SOFTWARE ASSOCIATES, INC.
SNA-3270

Network Software Associates, Inc. has announced the SNA-3270, a communications emulator that allows IBM Personal Computers and compatibles to communicate with IBM mainframe systems using IBM's Systems Network Architecture (SNA).

According to a spokesman, SNA-3270 allows an IBM Personal Computer to emulate a variety of IBM remote devices, including the IBM 3270, 3770, 3790 and 8100 SNA devices. The software runs on an IBM Personal Computer or Personal Computer XT with IBM's PC-DOS 2.0, 128K bytes of memory and IBM's Synchronous Data Link Control (SDLC) adapter.

The spokesman said SNA-3270 is comprised of three components. The SNA-3270 Logical Unit (LU) 2 component allows a user to define to the host system that the Personal Computer is a normal 3270 Physical Unit (PU) type 2, LU type 2. The user can then utilize the emulator as if it were a regular 3270-type cluster controller, 3274-51C control unit and 3278 model 2 terminal combination. Both the terminal and controller functions are performed by the Personal Computer.

The SNA-3270 LU 2 PC-DOS component allows the emulator to run concurrently with PC-DOS programs. The SNA-Remote Job Entry (RJE) LU 1 component supports LU Type 1 protocol for IBM 3770 or 8100 remote job entry.

The SNA-3270 emulator is written in C and can be ported to different hardware configurations.

It is priced at $600.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

TEXAS INSTRUMENTS, INC.
Ethervoice

Texas Instruments, Inc. has introduced Ethervoice, a product that adds "voice mail" capabilities to TI's Professional microcomputer with the Speech Command option.

Ethervoice reportedly allows the Professional with Speech Command to send voice messages to other Speech Command-equipped Professionals over the 3Com Corp.'s Ethermail electronic mail module on a Xerox Corp. Ethernet local-area network.

Voice messages reportedly may be sent separately or with text messages. Ethervoice is said to record in 9,600 or 2,400 bit/sec modes.

Ethervoice is priced at $150.

Texas Instruments, Data Systems Group, P.O. Box 809063, Dallas, Texas 75380.

EXTENDED SYSTEMS
Shareplot ESI-6012; ESI-6016

Extended Systems has announced Shareplot ESI-6012 and ESI-6016, boards which act as buffers between an IBM Personal Computer XT and a plotter.

Shareplot receives data from the microcomputer, stores it in a 128K-byte buffer and then transmits it to the plotter at a slower speed, Extended Systems said. The product is said to support data transmitted at speeds ranging from 300 to 19.2K bit/sec.

With the product, three users reportedly can share one plotter. The board fits in an expansion slot in the IBM Personal Computer. Additional computers can send their data to the microcomputer through a serial port.

ESI-6012 and ESI-6016 cost $595 each. ESI-6012 reportedly is able to function at a distance of up to 1,000 ft from the IBM Personal Computer XT.

Extended Systems, P.O. Box 4937, Boise, Idaho 83711.

TAILOR from page 101

grate data from various applications," said Neil Cookrish, product manager at Bankers Trust in New York. "Although the vendors understood our problem, they were more interested in writing other applications than in helping us, so we have begun to design the product ourself."

Some vendors, aware of Cookrish's problem, are including tools to help microcomputer support staffs. Wilton Jones, chairman of Multimate International Corp. in E. Hartford, Conn., stated that his company is looking at a number of possible methods to allow companies to customize the Multimate word processing package.

"We are thinking of supplying a company with generic word processors that include programming tools so they can customize applications," Jones stated. The tools would include a powerful macro capability and a licensing agreement that allows the company to tinker with the product.

Another option Jones mentioned was supplying vertical word processing packages, such as a simple word processing package that executives could use to write short memos.

Other tools

Other vendors also are supplying tailoring tools. Overlooked in the release of Lotus Development Corp.'s Symphony and Ashton-Tate's Framework were their powerful programming capabilities, according to Mort Rosenthal, vice-president of marketing at Corporate Software, Inc., a Waltham, Mass., software supplier.

"The key to the success of both products will be how effectively companies stretch product capabilities," Rosenthal said.

"Historically, Ashton-Tate helped anyone interested in expanding any of its product's capabilities. The success of Dbase II was predicated on Ashton-Tate support of third-party suppliers.

"Lotus has not been as interested in helping others exploit 1-2-3's capabilities," Rosenthal said.

XENIX from page 101

three users, depending on how the system is used," said Stephen Caswell of the Trigon Systems Group in Toronto. "There's a real question about IBM's intentions for Xenix," he added. "It may be there for politics."

In one common theory, IBM plans to introduce a proprietary multiuser operating system for the AT, perhaps a micro version of VM, in the not-too-distant future.

"Xenix is perfect at this time; it's too much of a jump to their own operating system. IBM is saying 'open architecture' again, but a little less so this time," Meserve said.

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COMPUTER INDUSTRY

Electronics industry resists organized labor

By David Olmos
CW Staff

Last June, 1,700 employees at Scientific-Atlanta, Inc. rejected unionization by nearly a 3:1 margin in a representation election organized by the International Brotherhood of Electrical Workers (IBEW), the sixth time various unions have lost bids to organize the company's workers since 1962.

In another union election two months earlier, 146 production workers at Quadram Corp. in Norcross, Ga., easily defeated an organizing effort by the International Brotherhood of Teamsters.

The votes at Scientific-Atlanta and Quadram are two recent examples of the plight facing organized labor in its attempt to gain a foothold in the electronics industry. Despite labor's drive to enlist high-technology workers, the industry remains overwhelmingly nonunion.

Some statistics tell the story. Of 162 companies belonging to the Massachusetts High-Technology Council, not one is unionized. In the industry's other hotbed of activity, California's Silicon Valley, a mere handful of more than 2,000 companies has unions, according to the American Electronics Association (AEA).

"The opposition is formidable, very concerted," said Charles McDonald, assistant director of organizing for the AFL-CIO in Washington, D.C. "When we have made probes at some of the high-tech companies, they have been extremely quick to respond. It's pretty alarming."

In recent interviews, industry representatives commonly explained the failed efforts of the unions by boasting, among other things, of more progressive management-labor practices.

"Management has been more employee-oriented, more humanistic," declared Norman Parks, director of employee relations at Sanders Associates, Inc. in Nashua, N.H., and a member of the AEA's labor relations subcommittee.

Data General Corp. spokesman Jeff Bartman added, "I think the general impression is that the high-tech industry has working conditions and sensibilities that are sophisticated enough so that unioniza-

See **UNION** page 131

■ Boeing Co. and its Boeing Computer Services Co. subsidiary have traditionally been mainframe- and minicomputer-oriented, but are now striving to develop an integrated plan to accommodate micros, which are doubling in number annually/**115**

■ MDS Qantel, Inc., a subsidiary of Mohawk Data Sciences Corp., recently lost its second major lawsuit in one year, this time being ordered by a jury to pay $12.6 million to a former distributor/**116**

■ Trilogy Ltd., Gene Amdahl's troubled company without a product, is exploring a new relationship with its major investor, Sperry Corp./**124**

Execs urge Congress to adopt noninterventionist policy

By Kathleen Burton
CW West Coast Bureau

SUNNYVALE, Calif. — The financial and technological success story of California's Silicon Valley could be re-created in other parts of the U.S. and perhaps even in ailing smokestack industries, a gathering of California high-tech witnesses told members of Congress' Joint Economic Committee at a two-day hearing here recently.

The hearings are part of a Congressional fact-finding series on entrepreneurship and innovation. They were continued


Lungren

in Boston and are scheduled to conclude with a session of university presidents in Washington, D.C., on Sept. 14.

Robert Noyce, vice-chairman of Intel Corp., said, the "Silicon Valley phenomenon can occur in other places, but the maturation process for this is longer than one election campaign, and that makes it difficult to address in Congress."

Noyce and 11 other witnesses urged the committee to adopt a noninterventionist attitude and not to create an overall industrial policy that would provide money and assistance only for certain targeted high-technology industries. Such a centralized policy, witnesses argued, would ultimately destroy Silicon Valley by discouraging risk-taking entrepreneurs and failing to reward those who do succeed.

"We want to see what made the successes here and what lessons can be applied elsewhere," explained Rep. Daniel Lungren, (R-Calif.), who chaired the session.

See **CONGRESS** page 132

Unions vs. high tech: Is history destined to repeat itself?

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

The story above concerning the inability of American unions to break in to the world of high technology may leave some U.S. executives feeling overly smug. That attitude would be self-defeating.

The fortunes of U.S. unions these days are at probably the lowest ebb since hundreds of thousands of American workers began signing their union cards. The alliance between the AFL-CIO and the Democratic Party is seen by many to be mired in an attempt to turn back the clock.

Following the worst recession since World War II, many Americans are just glad to have a dependable job, and the resurgence of American enterprise is a record with which few can argue.

But as high technology begins to make up a larger part of the U.S. economy and the current high-tech champions shift from producing state-of-the-art machines to mass-producing commodity machines, the glamour of the computer industry may begin to tarnish.

Already there have been studies claiming to show that high-tech employment is not all it's cracked up to be. Attention is shifting away from the instant millionaires produced by initial public offerings and focusing on what some people claim are low-paid, boring jobs on component assembly lines. Additionally, the much-expected automation of American industry in general is certain to cause a degree of uncertainty and perhaps hysteria among workers.

While some computer industry leaders compare any current distrust of automation to the short-lived siege of the Luddites, they fail to remember history lessons describing the first industrial revolution as a jarring period for Dick-

See **HISTORY** page 130

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Dear J. L.:
You've been talking a lot recently about chargeback billing for computer time. My department is charged a flat overhead rate for our VAX computer service. Another department uses the computer far more than we do, yet we have to pay the same overhead. What can I do? Signed, Rankled

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I also assume you have talked with your organization's dp manager. This is the first step I would recommend. Sometimes, however, the dp manager himself recognizes the value of a chargeback system for both shared-cost accounting and resource use reporting but cannot convince upper management that such a system is needed.

Why? Catch-22. If he had a good chargeback system, he could present management with hard statistical evidence that one was needed, but since he doesn't have one, he can't.

In such a case, you may want to direct your complaint to your finance department. They certainly should see the value of a chargeback system for computer resources, especially if your company bills clients for computer time or space.

But what if all your efforts to get a chargeback system fail? Then forget it. Life is short.

If, on the other hand, your company decides they want a chargeback system be sure to tell them about PACS, the VAX/VMS Process Accounting and Chargeback System from Signal Technology, Inc.

PACS is easy to install, easy to use, and will give your dp department a handle on its computer resources.

If you convince them to learn more about PACS, have them give Signal Technology a call. That way you can be sure you will have the best from the start.

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Dispelling a myth: Evidence against a shakeout

OUTSIDE LINES
David C. Dykstra

The biggest myth concerning the computer industry is: "There will be a major shakeout of computer companies, and only a few companies will survive."

Various versions of this quote have been stated by experts and printed in the media for the past 20 years. The number of companies, however, has increased every year. Many computer companies have failed, but every failure has been replaced with two or more new companies.

In the U.S., there are now over 500 companies making basic computer units. There are over 2,000 companies making computer peripherals and supplies. There are more than 10,000 businesses providing computer products and services, including software. And there are many new independent contractors and software developers in the new computer cottage industry.

Why are the experts and media predicting a shakeout? Obviously the larger, more established firms would like the public to believe this so the consumers will favor their products. Many of the professionals in the computer field cannot, or by choice do not, keep up with the rapid changes in available products. The safe recommendations, therefore, are for them to favor the products of the largest companies.

Proper planning

In addition, many of the large professional firms and educational institutions are establishment-oriented. They believe that good products come from what they call proper planning according to the procedures in the books they read and write. They do not believe (or maybe, do not want to believe) that the casual or informal planning style of many new companies can develop and support technologically advanced quality products.

The current fast-growing segments of the computer industry are small computers, software and services, including the office automation products. These products are receiving a lot of glamour and attention, but they currently represent less than 15% of the industry's product sales.

The larger companies, therefore, must continue to direct their emphasis toward the larger computers. Product development and sales of smaller computers and office automation products have received their impetus primarily from the smaller firms.

As computers have become smaller and less expensive, it has been easier to develop cost-effective special-purpose computers. Some examples are the computers in automobiles, robots and production-control machines. Even the general-purpose personal computers that most people are familiar with have many differences.

Most computers use common chips and base components, but the integration of the components and the final assembly design will determine the relative performance of the various computers. One computer may be better for word processing, while another is better for graphics, and so on.

Increase in variety

As the cost of computers continues to decline while performance continues to increase, the variety of applications will increase. The niches in the computer manufacturing area will be comprised of many special-purpose computers.

Many of the best small-business computer products come from newer companies, not from IBM and the other large companies. Nearly every purchaser of computer products compares his purchase with the larger companies' products.

The smaller companies are also up against the large companies' formidable selling techniques and pressures. The small companies, therefore, could not exist if they did not have better products.

Why will the number of computer companies continue to increase? New technologies or niches within the computer industry arise as the total industry grows and the entry cost for new companies coming into the computer-making foray continues to decline. Smaller companies are more creative and flexible. The best service usually comes from the smaller, owner-manager businesses.

As many high-tech companies grow and prosper, the creative individuals who started the companies will leave and start over again. As companies grow, they become more structured, and, because of this, many creative individuals leave as they prefer the smaller, less-structured type companies.

In addition, many people will obviously work longer hours when they have a chance to become wealthy in their own business.



Dykstra is an author, lecturer and independent consultant in the areas of data processing and office automation. He is president of Dykstra Consultants in Newport Beach, Calif.

COMPUTER INDUSTRY

Boeing subsidiary plans integrated, multiuser micro net

By Kathleen Burton
CW West Coast Bureau

SEATTLE — A Boeing Co. subsidiary based here is incorporating microcomputers into its traditionally mainframe and minicomputer environments. The Boeing Computer Services Co. began purchasing IBM Personal Computers in 1981, and now has some 1,900 micros from various manufacturers. The number is doubling every year, according to Douglas Frederick, manager of Boeing's Workstation Technology Group.

"So far, micros at Boeing are mostly being used as single-user, stand-alone workstations," he said, "but plans are to evolve them into fully integrated, multiuser systems in a Unix or expanded DOS environment with local-area networks, high-speed 3270 host access and integrated software."

Boeing Computer Services was founded in 1970 through the consolidation of 13 separate computing organizations at Boeing. It now has more than 9,500 employees and $540 million worth of computing equipment and functions as the focal point for all computing at Boeing offering commercial teleprocessing services to some 2,000 clients through five U.S. data centers, according to its president, Robert Dryden.

With 40% of its client base composed of U.S. Department of Defense agencies and contractors, Boeing Computer Services is highly security-conscious, "especially about designs and projects still on the drawing board," Frederick said. "We've installed keylocks on the hard disks and are looking at password protection and encryption to improve the file transfer security from our mainframes, but we're still not happy with the data security of our [personal computers]," he said.

Information is communicated between Boeing's mainframes and microcomputers via local-area networks based on 3270, Systems Network Architecture or asynchronous communications architectures, said M.U. Ayres, general manager of Boeing's Network Services. "Uploading and downloading files between the mainframes and [personal computers] works fairly well," Ayres said, "but we can't distribute software electronically due to the present structure of the licensing agreements."

In the micro area, Boeing Computer Services sets standards, approves and tracks all purchases, evaluates hardware and software and runs training and demonstration centers for Boeing staff.

Richard Metz, manager of Boeing Computer Services' Office Information Systems, said Boeing is recommending Xerox Corp., Hewlett-Packard Co., Digital Equipment Corp., Wang Laboratories, Inc. and IBM micros to Boeing's MIS departments. Metz said that by 1990, Boeing plans to have one micro for every two employees.

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Boeing opens AI center

By Kathleen Burton
CW West Coast Bureau

SEATTLE — The Boeing Computer Services Co., the teleprocessing division of the Boeing Co., opened an artificial intelligence center here recently to serve as the hub for all AI research and development activities at Boeing.

"Artificial intelligence is essential to us if we want to increase our future productivity," said George Roberts, general manager of Boeing's Advanced Technology Applications Division (Atad), under which the new AI division is housed.

For its research work, the AI center uses a VAX-11/780 mainframe computer, two Symbolics, Inc. 3600 Lisp computers and several Unix-based workstations. "The center is fairly Spartan now," said Del Rowan, spokesman for Boeing Computer Services, "but it will grow 20% to 30% during 1985." The company would not release figures on the cost of the center, but Rowan said the spending level of AI research and development companywide is "in the tens of millions of dollars annually and growing."

The AI center, staffed by 25 scientists, trains Boeing computer scientists in AI techniques; serves as a reservoir of outside AI talent, attracting scientists from think tanks and university research labs; and supports Boeing's software engineering and network applications divisions, according to Roberts.

Under the center's newly organized AI associates program, 23 engineers and computer scientists drawn from different Boeing divisions will spend a year at the center learning AI theory and working on a specific AI problem related to their home divisions. When the year is up, each will take with him the software, hardware and documentation developed while at the center.

Present AI research efforts include machine vision, speech recognition, natural languages, robotics and expert systems, Roberts said.

COMPUTER INDUSTRY

MDS Qantel loses second multimillion-dollar fraud suit

HAYWARD, Calif. — A defunct Detroit computer distributor has become the second MDS Qantel, Inc. dealer to win a multimillion-dollar fraud suit charging Qantel with fraud for supplying defective products.

The recent verdict by a Hayward Superior Court jury awarded $12.6 million, including $10 million in punitive damages, to Datapro Corp., a Detroit firm that distributed MDS Qantel products for six years until it ceased operations in 1982.

The verdict came little more than a year after a Boston federal court jury awarded a Massachusetts firm, Computer Systems Engineering, Inc., $17 million on its claim that Qantel's Solutions accounting software was defective. The trial judge later reduced the Massachusetts award to $5 million.

Datapro attorneys Thomas Christo and Robert G. Watson argued that Qantel deceived its distributors into believing that the firm planned to market its products, including Solutions, through its distributor network. "Instead, what Qantel was doing was using the distributors as a shield, while its products were defective," Christo said after the verdict.

Datapro's suit, which was filed as a cross-complaint after Qantel filed a breach of contract suit in 1982, charged that Qantel knew its products were defective and that it planned to drop its distributors once the defects were worked out of the products.

MDS Qantel Executive Vice-President for Finance Joe Brooks said last week, "The company believes that the jury findings on the defendant's counterclaim were improper and unsupportable and has instructed its counsel to take all steps necessary to set aside the jury verdict."

Before the case went to trial last month, Datapro and a second firm, DP Corporate Services, Inc., owned by Datapro principal shareholder Wilhelm Kast, settled the breach of contract claim by agreeing to pay Qantel $240,000.

Christo said that sum will be offset against the jury's verdict.

That verdict was for $2,698,208 in actual damages suffered by Datapro and $10 million in punitive damages.

"The punitive damages are what the jury feels is necessary to punish the wrongdoer and to make sure they don't do it again," Christo said, noting that it was particularly appropriate that the jury punished a computer company in a case being tried "on the edge of Silicon Valley."

Christo said that after subtraction of the $240,000 settlement and addition of interest and attorney fees, the Datapro award could reach $15 million.

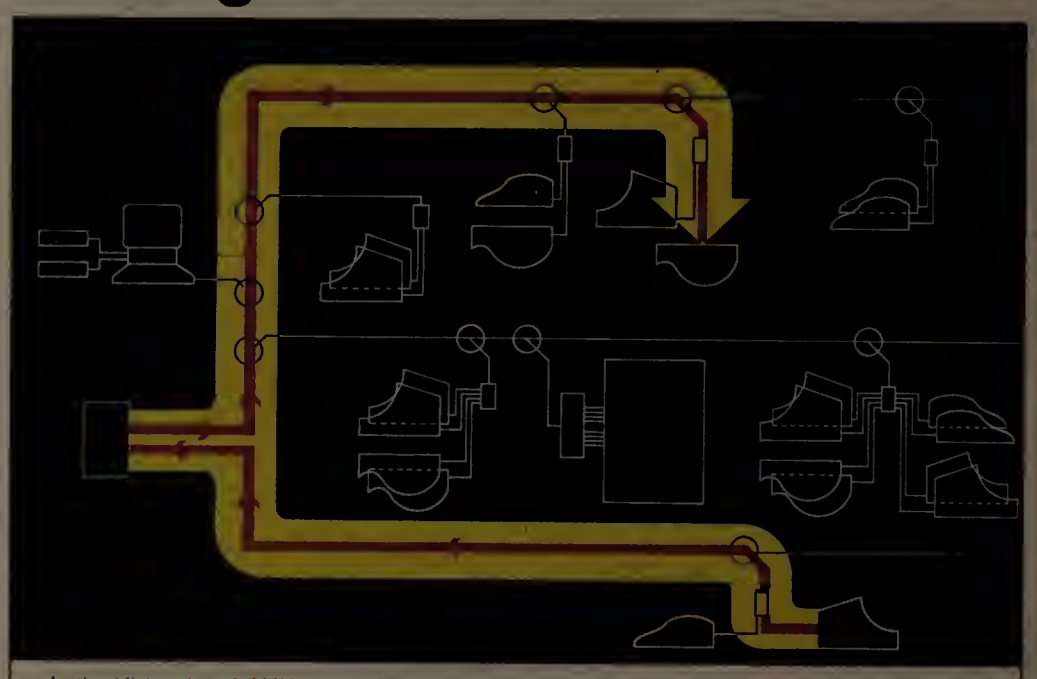
New from Interactive Systems/3M:

The first high-speed broadband local-area network that guards against data crashes.

If you've been thinking of investing in a contention network, consider this: How do you guard against data crashes during times of heavy system use?

Answer: You don't, because contention schemes simply don't provide any kind of data insurance.

Fortunately, there is a new type of network that *does* protect against data loss. It's called 3M Videodata® LAN/1. And it's the first intelligent broadband local-area network that's designed to get data through on time, no matter how much traffic is on the cable.



In the Videodata LAN/1 network, messages can be sent from any terminal to any other without going through the host processor. Network Interface Units (NIUs) connect digital devices to mechanical taps (shown as small circles) on the main coaxial cable. A Network Monitoring Unit, or NMU, keeps a statistical record of network performance.

Videodata® LAN/1: The efficiency of token-passing plus the proven flexibility and expandability of broadband.

Token-passing networks eliminate contention troubles and data crashes by passing an electronic "token" from terminal to terminal. When a terminal has to transmit, it grabs the token and sends data packets to the receiving device. Receipt is acknowledged and the token is automatically released to continue its rounds. Because the system assigns a network entry address to each user, everyone has an opportunity to send data during each token cycle.



Because Videodata LAN/1 is a broadband system, dedicated channels can be used for full-motion video applications such as CAD/CAM and teleconferencing. These video signals are kept entirely separate from digital traffic on the network's token-passing channels.

So far, so good. But most token-passing networks are baseband systems, meaning that terminals must share a common channel as they would in a typical contention network. This can limit speed and capacity in some applications.

LAN/1 overcomes this possible limitation by combining token-passing with a proven *broadband* technology that allows many channels to be put on a single cable. The payoff: higher channel speeds, ranging up to 2.5 MB/s over a maximum seven-mile radius, with terminal data rates of up to 19.2 KB/s. Plus a capacity of up to 10,000 devices to allow plenty of room for future expansion.

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Separate channels for voice, video, and graphics. Plus the ability to work in point-to-point applications.

Because LAN/1 is a broadband network, channels can be set aside for real-time voice, video, and high-speed graphics. This can be done without compromising digital traffic capacity.

LAN/1's broadband design also permits flexibility in network architecture, so that it can be used in high-speed point-to-point applications which can't be served efficiently with contention systems.

Other benefits include full transparency, an automatic shut-off feature to keep any one terminal from capturing the token, and compatibility with both dumb and intelligent terminals. The list of features goes on and on.

For the full story on the new Videodata LAN/1 network from Interactive Systems/3M, call 800-328-1684 toll free. (In Minnesota, 800-792-1072.) Or mail the coupon.

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Encore garners $52 million in finance deal

WELLESLEY HILLS, Mass. — Encore Computer Corp., the company founded last year by former Prime Computer, Inc. President Kenneth G. Fisher and executives from other leading superminicomputer vendors, recently announced the completion of a $52 million financing program and plans to develop multiprocessor superminicomputers.

Henry Burkhardt III, chief financial officer of Encore and formerly in the same position at Data General Corp., said the company sold $22 million of convertible preferred stock through a private underwriting to a group of corporate, institutional and private investors and has received a three-year commitment for a $30 million revolving line of credit.

Burkhardt said the company was pleased by the response of the financial community "in view of the unusually erratic private placement market these past few months."

"By mid-1985, we plan to announce our initial range of high-performance, multiprocessor computer systems," Fisher said.

"The Encore product line will also include operating system software and high-resolution graphics systems. Encore systems will offer several times the price/performance of current superminicomputers," Fisher said.

DEC defectors

Another founder of the firm is C. Gordan Bell, former chief technical officer of Digital Equipment Corp. and one of several DEC vice-presidents to depart that company last year.

Encore reportedly has also hired several former Prime Computer executives. Fisher claimed to have "hired some of the best executives, marketers and engineers in the computer business."

Fisher said Encore currently employs more than 100 people and is organized into small independent operating units, each responsible for development, manufacturing and marketing of its own products and with individual profit and loss responsibilities.

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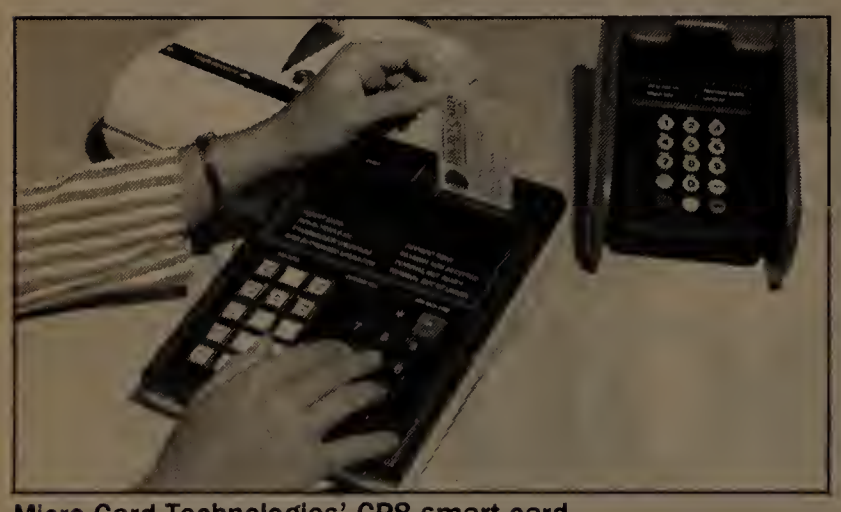
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Micro Card Technologies' CP8 smart card.

Firm to sell smart cards in U.S.

DALLAS — A Dallas start-up company has announced that it will produce and sell a French-designed smart card, with an early emphasis on the data security and credit card markets.

Officials of Micro Card Technologies, Inc., a subsidiary of the French firm Bull-CP8, a unit of the Bull Group, last week announced that they now can supply CP8 cards, designed by Bull to include a Motorola, Inc. 6805 microprocessor.

Richard L. Dunham, Micro Card Technologies' president, said the cards now being offered are made in France and that cards made in Dallas will be available during the fourth quarter of 1985.

"I think that eventually the cards will be used everywhere in a corporation — from the guard gate and the time slot to the company treasurer accessing the data base," Dunham said.

Dunham said the smart card, a credit-card-size embossed plastic card that has a penny-size microprocessor embedded in its face, can store several pages of financial, medical or educational records in its 8K bits of erasable programmable read-only memory.

But it can also be used to store access verification information, such as a user's personal identification number, that in the past has been stored in a company's data base.

Initial uses of the card, now in field test with several corporations that he declined to identify, will include on-line and off-line physical and data access control in computer rooms.

It can store several pages of financial, medical or educational records.

"We're working with a proven technology whose time has come. The CP8 smart card has so much to offer in terms of convenience, speed and security that this is likely to be another case in which technology drives the market, just as it has with personal computers," Dunham said.

Prices for the cards range from $3.50 to $4 per card in quantities of about one million, or $15 per card. A typical large corporation will pay about $8 per card.

Dunham said the firm will also market card readers, but it will deal primarily with OEMs in that field. He said such readers will range from under $100 to a maximum of $500, depending on the configuration.

Micro Card Technologies is located at 12740 Hillcrest Road, Dallas, Texas 75230.





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The 2350 and 2410 use industry standard interfaces making them hardware compatible with most mini and microsystems on the market today. In addition, they are supported on the menus of most of the important software being offered to microsystem users like VisiCalc®, Lotus™ 1-2-3™, dBASE II®, Peachtree 500™ and General Ledger, Multimate™, WordStar®, etcetera, etcetera.

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PE announces 1984 rise in profit

NORWALK, Conn. — Perkin-Elmer Corp. recently announced fiscal-year 1984 revenues of $1.18 billion and profits of $66.1 million, or $1.49 per share, which included an extraordinary fourth-quarter gain of $11.6 million, or 26 cents per share, and a pretax charge of $6.2 million, or seven cents per share. Without the two extraordinary items, earnings per share for the year would have been $1.30.

A year earlier, Perkin-Elmer had revenues of $1.01 billion and profits of $50.2 million, or $1.15 per share.

For the fourth quarter ended July 31, the company reported revenues of $340 million, compared with year-earlier revenues of $275 million, and profits of $29.1 million, or 66 cents per share, compared with year-earlier profits of $16.5 million, or 38 cents per share.

Pretax profit for the year in the company's Data Systems Group was up only $500,000 from the previous year, with group revenues increasing to $233.1 million from $214 million in 1983. Pretax profit in its Semiconductor Equipment Group, however, was up $15.6 million over 1983, with revenues increasing to $257.8 million from $170 million.

The extraordinary gain recorded in the fourth quarter was an adjustment of tax reserves established in prior years and primarily due to federal legislation signed earlier this year canceling deferred taxes accumulated by domestic international sales companies. The pretax charge was for establishment of a voluntary retirement assistance program.

Profits down at Dysan

SANTA CLARA, Calif. — Dysan Corp. reported a loss of $15.2 million, or 89 cents a share, before securities gains, for the third quarter ended Aug. 4, compared with a year-earlier profit of $2.9 million, or 17 cents a share, before securities gains.

Securities gains for the quarter were $749,000, or 5 cents a share, compared with $13.2 million, or 77 cents a share, during the same period in 1983. Third-quarter revenue was $52.1 million, compared with $48.5 million a year ago.

Dysan said it paid $12.6 million in research and development expenses for its affiliates during the quarter, compared with $4.7 million a year ago.

Panatech, Ricoh enter sales pact

LOS ANGELES — Panatech Research & Development Corp. and Japan's Ricoh Co. Ltd. recently announced an agreement on the technology and marketing of advanced semiconductor products.

The agreement calls for each of the companies to sell the other's products in their respective markets. Panatech, based here, will market products manufactured by Ricoh's Electronic Devices division under the name Panatech/Ricoh in North America. These products include Cmos erasable programmable read-only memory, Cmos Mask read-only memory, gate-array, standard and semicustom microprocessors and microperipherals and various I/O products such as high-resolution and thermal printer heads.

Ricoh, an office automation concern with $2.1 billion in annual sales, will market Panatech's semiconductor products in Japan and Southeast Asia. Panatech has entered into an agreement with Burns Research Corp. of Santa Clara, Calif., in which Burns will act as a design and prototype center for Panatech/Ricoh application-specific integrated circuits.

Arthur J. Rosenberg, president of Panatech, said the company expects to become "a significant factor in the U.S. semiconductor market" as a result of the agreement.



COMPUTER INDUSTRY

ITC to probe Tandon's copyright infringement allegation

By David Olmos
CW Staff

LOS ANGELES — The International Trade Commission (ITC) recently said it will investigate claims by Tandon Corp. charging a California company and a South Korean company with copyright infringement and unfair competition involving the manufacture and distribution of disk drives.

The commission's investigation stemmed from allegations made by Tandon, a Chatsworth, Calif., disk drive manufacturer, in a petition filed in federal district court here last month accusing Format Corp. of Westlake Village, Calif., and its founders of fraud, sabotage and unfair competition. The suit further alleges that Gold Star Tele-Electric Co. Ltd., an affiliate of Lucky Goldstar Group of South Korea, paid $500,000 to Format to obtain technology stolen from Tandon.

The investigation will determine whether a line of disk drives allegedly made by Goldstar and distributed by Format under the name of Easy Application Series should be barred from importation in the U.S.

Tandon has asked the commission to exclude temporarily the entry into the U.S. of disk drives manufactured by Lucky Goldstar as a result of unfair competition. Tandon is also seeking a temporary cease and desist order prohibiting Format from selling its existing inventory of disk drives in the U.S.

The ITC action names the Lucky Goldstar Group and several affiliates and subsidiaries in the U.S. and Korea. It also names Jay J. Ahn of San Jose, Calif.; Michael Anisimov of Canoga Park, Calif.; Felix Markhovsky, also of Canoga Park; Herbert Berger, no address given; and G. Edward Wilka of Newbury Park, Calif.

According to a Tandon spokesman, Anisimov and Markhovsy are two former Tandon engineers whom the suit accuses of industrial espionage, fraud, sabotage and a cover-up of their activities. The suit claimed that in 1983, while Anisimov and Markhovsky were employed by Tandon, they competed with Tandon on behalf of Format.

Ahn is described as a businessman who organized Format together with Lucky Goldstar. Berger and Wilka were the founders of Format, according to the suit.

In its federal court action, Tandon is seeking $50 million in actual damages and asks that those damages be trebled under the Racketeer Influenced and Corrupt Organizations Act.

A spokesman who answered the phone at Format in California and who declined to identify himself said the company would have no comment on the suit at this time.

S.K. Kim, manager of overseas operations for Lucky Goldstar International, Inc. of Lyndhurst, N.J., an affiliate of the Korean-based firm, said he had no knowledge of the suit.



Cmos cell pact signed

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. and LSI Logic Corp. recently signed a joint agreement for the development of a Cmos standard cell library for design of large-scale integrated circuits.

According to a spokesman for Advanced Micro, the agreement also calls for Advanced Micro to serve as an alternate source for LSI's LL7000 series of 2 micron Cmos gate arrays.

The two companies said they will cooperate on a joint definition of the Cmos structured cells, which will include complex logic and memory functions.

Advanced Micro will provide the required 1.6 micron Cmos process technology, and LSI will be responsible for software development.

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Infodata's free MIS Executive Seminar

For all the talk about PC/mainframe issues, you'd think more people would have actually done something.

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Atlanta	Sept. 20	Minneapolis	Oct. 30
Baltimore	Oct. 11	Montreal	Oct. 17
Boston	Sept. 25	New York City	Sept. 11
Charlotte	Oct. 31	Philadelphia	Oct. 18
Chicago	Oct. 9	Pittsburgh	Oct. 16
Cleveland	Sept. 6	Rochester	Nov. 1
Dallas	Oct. 17	San Antonio	Oct. 10
Denver	Oct. 11	San Francisco	Sept. 18
Detroit	Sept. 18	Tulsa	Sept. 11
Hartford	Sept. 19	Vancouver	Oct. 9
Hasbrouck Heights	Nov. 14	Virginia Beach	Sept. 5
Houston	Sept. 26	Washington, DC	Sept. 26

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Record profits at ADP mark 35th year

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) recently reported revenues for the fiscal year ended June 30 were $888.9 million, an 18% increase over fiscal-year 1983 revenues of $752.8 million.

Profits for the year were $75.1 million, or $2.14 per share, up 16% compared with 1983 profits of $64.5 million, or $1.86 per share.

For the fourth quarter, ADP reported revenues of $233.1 million, an 18% increase over year-earlier revenues of $196.9 million. Profits for the quarter were $21.8 million, or 62 cents per share, up 16% from year-earlier profits of $18.7 million, or 54 cents per share.

The company noted that 1984 was its 35th anniversary as a company and the 35th consecutive year of record revenues and profits.

Josh S. Weston, president and chief executive officer of ADP, said the company sustained strong revenue growth in commercial services, financial information services and collision estimating divisions, but experienced "a severe softening of trading volume" in its brokerage services.

Anacomp reports losses down in third quarter

INDIANAPOLIS — Anacomp, Inc. said it lost $9.2 million, or 71 cents a share, for the third quarter ended June 30, compared with a loss of $11.5 million, or 95 cents a share, during the year-earlier period.

The company reported revenues rose to $32.6 million from $30.9 million a year ago.

Anacomp also said it was changing its fiscal-year reporting period to end on Sept. 30 instead of June 30. The company said changes in its business and financial operations have made Sept. 30 a more natural end to its fiscal year.

Anacomp had previously reported financial problems stemming from development of a comprehensive banking software system.

Trilogy to enter pact with Sperry

CUPERTINO, Calif. — Trilogy Ltd., the heavily financed start-up company that failed in its attempts to develop a large-scale, IBM-compatible processor and semiconductors based on wafer-scale integration, announced last week it was pursuing an agreement with its largest investor, Sperry Corp., on a joint development program.

Founded by Gene Amdahl, also the founder of Amdahl Corp., Trilogy raised almost $300 million from investors, including $42 million from Sperry, before canceling the processor project [CW, June 18] and "suspending" the semiconductor development [CW, Aug. 13].

Recently, Trilogy disclosed it had signed a letter of intent with Sperry and would pursue a definitive agreement to cooperate on developing a high-performance, gate-array-based technology suitable for inclusion in high-performance communications and computer systems.

Sperry, according to Trilogy, had committed itself to pay Trilogy a quarterly payment in September of approximately $2 million.

Trilogy would provide certain design services to Sperry on a contractual basis, and the two companies would separately perform certain aspects of the development effort, a Trilogy spokesman said.





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COMPUTER INDUSTRY

EXECUTIVE CORNER

Charles S. Strauch has been appointed to the position of president and chief executive officer and member of the board of directors at MSI Data Corp. Strauch succeeds MSI cofounder, **William J. Bowers**, who will remain as chairman of the board.

Strauch, 49, was executive vice-president at Gould, Inc., where he was responsible for building electronics and electrical businesses. He has also served as president of Memorex Corp., chairman and president of Magnuson Computer Systems, Inc. and, most recently, as chairman of Computers International, Inc.

■

Richard W. Levandov has been appointed vice-president, marketing, of Phoenix Software Associates, Ltd.

■

Vic Morris has been named vice-president, marketing and international operations, at Cullinet Software, Inc.

■

Victor M. Martinelli has resigned as vice-president and chief financial officer of Informatics General Corp. Martinelli leaves the company to pursue personal interests.

■

Russell E. Molari has been named vice-president of software engineering services organization of Informatics General Corp.'s Professional Services Operations/West.

■

B. J. Meredith has resigned as chairman of the board of directors at Docutel/Olivetti Corp. for the purpose of pursuing other outside activities.

■

Stanley J. Sewall has been promoted to group executive, research and development, at Cincom Systems, Inc.

■

Ian R. G. Edmonds has been appointed corporate vice-president of systems and product marketing at Prime Computer, Inc.

■

Michael F. Conners has resigned from ATV Systems, Inc. as vice-president, finance and control. He will be replaced by **Peter Young**.

■

John J. Mitcham has joined Rolm Corp. as vice-president and general manager of the operations group.

■

Sanders Associates, Inc. has announced the following appointments: **Jack L. Keaton**, vice-president, international, for its federal systems group; and **Phillip H. Mason**, vice-president for the federal systems group, plans and programs.

■

RET Deltac Corp. has announced the following appointments: **William L. Zang**, vice-president, finance; and **Patrick V. Keene**, vice-president, technical director.

■

Donald L. Williams, has been promoted to vice-president, manufacturing at AST Research, Inc.

■

Maxtor Corp. has announced the following promotions: **Steven P. Kitrosser**, vice-president, manufacturing; and **Richard T. Jessen**, vice-

See **EXEC** page 126



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COMPUTER INDUSTRY

Ericsson profits show 19% rise

STOCKHOLM — L.M. Ericsson reported profits for the first six months of 1984 were $77.6 million, or $2.10 a share, a 19% increase over year-earlier profits of $65.4 million, or $1.97 a share.

The Swedish-based telecommunications and computer systems maker said its sales for the six-month period were $1.62 billion, 20% ahead of the $1.35 billion reported for the previous year.

Orders climbed 15% during the first half of this year to $1.73 billion. The company said 79% of its sales were made to customers outside Sweden.

EXEC from page 125

president, corporate development and planning.

■

Mark A. Floyd has been named vice-president and chief financial officer of Interphase Corp.

■

Mike Leachman has been promoted to vice-president of engineering, digital electronics; and **Al Vaitkus** has been hired as vice-president of engineering, mechanical products, at Megavaultok.

■

Brian S. Gaylord has been appointed to the position of vice-president, marketing and sales, replacing **William P. Karavatos** at Ztel, Inc. Karavatos was promoted to the new position of vice-president for business development. Both positions report directly to **Peter S. Anderson**, Ztel president and chief executive officer.

■

Avatar Technologies, Inc. announced the following appointments: **Dr. Frederick D. Wiersema**, vice-president of planning and marketing; **Paul J. Rusconi**, vice-president of finance; and **Michael S. Kudla**, director of manufacturing.

■

Ramtek Corp. has promoted **Steve Johnson**, **Perry Sarensen** and **Patricia Rooney** to newly created positions as vice-presidents in sales, field engineering and human resources, respectively.

■

Bob Jackson has been appointed to vice-president of operations at Kennedy Co.

■

Stephen J. Welsh has been named vice-president, network design, at Contel Service Corp.

■

Plexus Computers, Inc.'s President **William D. Jobe** announced his plans to join, as a general partner, an unnamed venture capital group. Indicating that over the next several months he will continue to participate actively in the day-to-day management of the company, Jobe said that a search for a successor is under way. Jobe also will remain on the Plexus board of directors.

■

Robert J. Amman has been named president of Bunker Ramo Information Systems, an Allied Corp. unit.

■

J. Allen Hufft has joined Advanced System Applications, Inc. as president and chief operating officer.

■

Michael R. Mitchell has been appointed president and chief executive officer of SP Information Services Network.

■

Nashua Corp. announced a restructuring of its senior management in which four present company officers will be given new responsibilities at the vice-presidential level, and a new vice-president has joined the company.

William W. Temple will move from his position as chief financial officer to vice-president and general manager, computer products division; **Eric Birch** has joined as vice-president, office systems division; **John J. Montesi** to vice-president, research and development; **William Luke** has been promoted to vice-president, finance and chief financial officer. **Norman T. Veillette**, who has served as vice-president, research and development, will fill the newly created position of senior scientist; and **Lawrence C. Hornor** will become vice-president, corporate planning.

■

Mentor Graphics Corp. announced a major reorganization and the appointment of five new corporate vice-presidents. **Gerard Langeler**, a Mentor Graphics founder and vice-president, marketing, has been named executive vice-president. **Mike Bosworth** has been promoted to director of marketing; **Steve Swerling** to vice-president and general manager, computer systems division; **Al Jimenez** to vice-president, advanced products program, automated products division; **Brian Henry**, vice-president and controller; **Berkeley Merchant**, vice-president, manufacturing; and **Frank Delia**, vice-president, general counsel and secretary.

■

Chuck Crayne has been appointed vice-president, technology, at Xerox Computer Services.

■

Richard J. Kielmeyer has been appointed to vice-president, operations and **James P. Marcella**, director of manufacturing operations at Mosaic Technologies, Inc.

■

Samir Kebbe has joined Tymshare, Inc. as director of consulting services for the firm's international banking and investment systems division.

■

Roger Damphousse has been named vice-president and general manager of the display products division at Calcomp.





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ITT COURIER

Televideo profit drops 84% to $994,000

SUNNYVALE, Calif. — Televideo Systems, Inc. said its third-quarter profits plunged 84% to $994,000, or 2 cents per share, from $6.14 million, or 15 cents a share, a year earlier.

Revenue for the quarter ended July 31 decreased 8% to $40.8 million from $44.5 million a year ago.

Average shares outstanding were 41.9 million, compared with 42.2 million last year, the company said.

K. Philip Hwang, chairman and chief executive officer, said the results were in line with the company's previously announced expectations. He attributed the lower revenues to slower-than-expected sales of the firm's IBM Personal Computer-compatible systems, which he said resulted from "market uncertainty over IBM price cuts."

Hwang said profit was adversely affected by advertising expenses related to the Personal Computer-compatible line and costs associated with a new manufacturing facility for the Computer Systems Division.

SUPERSHORTS

David J. Eskra, president and chief operating officer of **Pansophic Systems, Inc.**, has been named president of the **Software Products Section of the Association of Data Processing Service Organizations, Inc. (Adapso)**. As the chief representative of the Software Products Section, he will also serve as a member of the Adapso board of directors.

Eskra stated that his efforts will focus on enhancing the attractiveness of the software products industry to the investment and financial communities.

■

Seagate Technology, Inc. announced that it and its two domestic distributors, **Pioneer Research, Inc.** and **Wyle Data Services**, have mutually agreed to end their business relationship.

A third distributor, **Arrow Electronics**, and Seagate had severed their business relationship in late June. Seagate, however, will continue with its Canadian distributor, **Semad.**

"This announcement does not result from a dissatisfaction with the past performance of the distributors, but rather reflects a change in Seagate's overall distribution plans to increase our total distribution coverage and customer base," said Finis Conner, vice-chairman of the board for Seagate.

■

Signetics Corp. announced the formation of a new microprocessor/microcontroller design center at its Albuquerque, N.M., facility. To be known as **VLSI Design Center**, the group will concentrate on creating new microprocessor and microcontroller designs that will, in turn, be fabricated at the company's New Mexico factory.

■

Recognition Equipment, Inc. announced that it has established a wholly owned subsidiary, **Recognition Equipment (Asia) Pte. Ltd.**, based in the Republic of Singapore.

Sanne Chong has been appointed managing director of the subsidiary, which will initially provide promotional and developmental services in eight Asian countries. **Lily Oon Chong** has been named director of software and marketing.

■

A joint service agreement has been signed by **Digital Equipment Corp.** and **Micom Systems, Inc.,** whereby DEC will provide installation and maintenance services for the Micom Micro600/2 data private automatic branch exchange (PABX) when used in conjunction with DEC host computers.

This nationwide agreement, effective this past July, defines mutual responsibilities of both parties regarding maintenance and support of the Micro600/2 data PABX by the DEC field service organization. The agreement has a term of three years and includes provisions for renewal.

■

Xerox Computer Services has opened a major European data center facility in Ven-

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COMPUTER INDUSTRY

ray, Holland, as was announced by Michael W. Faber, national European operations manager.

The new Venray facility features state-of-the-art 3083/3725 IBM hardware with a dedicated line linked to Xerox Computer Services' 22,000-sq-ft Los Angeles data center. Xerox has designed the system so that, if necessary, all computer operations — including software loading, processing and production — can be managed remotely from Los Angeles.

■

Equitable Life Leasing Corp. announced that it has concluded an agreement with **Spectragraphics Corp.** to create Spectragraphics Leasing Corp., which will be a wholly owned subsidiary of **Equitable Life Leasing** to provide a wide range of leases for Spectragraphics' computer-aided design and manufacturing graphics workstations.

■

Comserv Corp. announced the leveraged buyout of its data center division into a new, independent company, **Professional Processing, Inc. (PPI).**

Former Comserv Data Center general manager **Ken Dalley** and operations manager **Chuck Sather** have become PPI's chief executive officer and chief operating officer, respectively.

■

Dataram Corp. announced the layoff of 74 employees, reflecting the decision to discontinue certain product lines.

■

Honeywell, Inc., a Fortune 500 company that developed a highly innovative program for its Vietnam veteran employees and their families, has been named by the **Disabled American Veterans (DAV)** as the DAV large employer of the year for 1984.

■

C Tek Software, Inc. announced that an agreement has been reached with **Sports Information Data Base, Inc. (SIDB).** The five-year contract states that C Tek will develop software products and lease interactive computer services to SIDB.

SIDB, located in Hasbrouck Heights, N.J., is a newly formed company that was "organized to create, market and maintain" a data base containing historical and statistical information on sports. The data base will contain computerized information on such sports as golf, horse racing, auto racing, bowling and boxing. Also to be included are collegiate sports and Olympic Games.

■

Xerox Corp. announced that it has established an artificial intelligence systems business unit. The new unit will be part of the Xerox Special Information Systems, which has its headquarters in Pasadena, Calif. The formation of the new unit is in response to what the company believes will be a significant increase in the artificial intelligence marketplace during the next two to five years.

■

Advanced Micro Devices, Inc. (AMD) and **LSI Logic Corp.** have signed a joint agreement for development of a Cmos standard cell library for design of large-scale integrated circuits.

The agreement also calls for AMD to serve as an alternate source for LSI Logic's LL7000 series of 2 micron Cmos gate arrays.

5¢ 10¢ NICKELS AND DIMES

Ask Computer Systems, Inc. reported revenues for the fiscal year ended June 30 of $65 million, compared with $39.3 million in the same period one year ago. Profits were $6.1 million, or 53 cents per share, compared with $3.9 million, or 35 cents per share, in the same period one year earlier.

Profits for the fourth quarter were $1.4 million, or 13 cents per share, compared with $1.5 million, or 10 cents per share, in the comparable period one year earlier. Revenues were $19.9 million, compared with $12.6 million for the same period last year.

C3, Inc. announced profits for the quarter ended June 30 were $1.4 million, or 15 cents per share, compared with a loss of $437,000, or 5 cents per share, in the same period one year earlier. Revenues were $15.4 million, a decrease of 6.7% over $16.5 million for the corresponding period last year.

■

NBI, Inc. reported revenues for the fiscal year ended June 30 of $177.1 million, compared with $120.9 million recorded last year. Profits were $13.8 million, or $1.40 per share, compared with $4.6 million, or 45 cents per share, one year ago.

■

Modular Computer Systems, Inc. announced second-quarter profits of $1.3 million, or 24 cents per share, compared with a net loss of $550,000, or 10 cents per share, for the second quarter of last year. Revenues were $20.7 million, compared with $21.1 million in the comparable period one year ago.

■

Timeplex, Inc. reported revenues for the fiscal year ended June 30 of $66 million, compared with $43.6 million a year earlier. Profits were $5.6 million, or 67 cents per share, compared with $3.4 million, or 45 cents per share, for the period a year earlier.

■

Systems & Computer Technology Corp. reported profits for the fourth quarter of $2.8 million, or 21 cents per share, compared with $2 million, or 15 cents per share, in the same period one year ago. Revenues were $15 million, compared with $11.5 million

See **NICKELS** page 130

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NICKELS from page 129

in the comparable period one year ago.

■

Linear Corp. reported profits for the fourth quarter of $1.3 million, or 47 cents per share, compared with $676,000, or 29 cents per share, one year ago. Revenues were $15.7 million, compared with $10.2 million for the same period one year earlier.

■

Western Micro Technology, Inc. reported revenues for the first quarter ended June 30 of $13.9 million, up from $5.8 million for the same quarter the year before. Profits were $755,807, or 30 cents per share, compared with $197,333, or 12 cents per share, for the same period one year ago.

■

Sun Microsystems, Inc. announced an increase in revenues of more than 300% to $39 million for its second full fiscal year ended June 30, with earnings per share of 21 cents, up from $9 million in revenue for fiscal year 1983 and earnings per share of 8 cents.

■

ISC Systems Corp. announced profits for the fiscal year ended June 28 of $10 million, or 67 cents per share, compared with $4 million, or 27 cents per share, a year earlier. Revenues were $127.7 million, compared with $79.6 million one year earlier.

Profits for the fourth quarter were $2.9 million, or 20 cents per share, compared with $1.3 million, or 9 cents per share, in the same period one year earlier. Revenues were $36.8 million, compared with $24.8 million in the same period one year ago.

■

Cipher Data Products, Inc. reported revenues for the fourth quarter of $116 million, compared with $76.4 million for the same period a year ago. Profits were $11.4 million, or 85 cents per share, compared with $5.1 million, or 50 cents per share, one year earlier.

■

Uccel Corp. reported its profit, before extraordinary credit, rose to $1.2 million, or 8 cents per share, in the second quarter ended June 30 from a $31,000 profit in 1983's comparable period. Revenues were $42.9 million, a 19% gain over the $36.2 million a year earlier.

■

Analogic Corp. announced profits for the third quarter ended April 30 of $4.5 million, or 25 cents per share, compared with $4.2 million, or 23 cents per share, one year earlier. Revenues were $36 million, compared with $32 million in the previous year.

■

Interphase Corp. reported profits for the second quarter ended April 30 of $114,000, or 4 cents per share, compared with $91,000, or 4 cents per share, one year ago. Revenues were $1.15 million, compared with $675,000 one year earlier.

■

Boole & Babbage, Inc. announced the results of operations for its third fiscal quarter ended June 30. Revenue for the third quarter totaled $6.5 million, up 32% from $4.9 million for the same period one year ago. Profits were $206,000, or 6 cents per share, more than double the $100,000, or 4 cents per share, reported for the same quarter one year earlier.

■

Science Management Corp. (SMC) announced that revenues increased 28% to $16.7 million in the second quarter ended June 30, and a net loss of $1.1 million, or 43 cents per share, was incurred.

Results in the second quarter included a loss of $1.3 million from the sale in June of SMC Intech to SMC Seicom, the joint venture company that markets Seiko Instruments USA business micros. The results also reflect a gain of $1.95 million

See **NICKELS** page 132

HISTORY from page 113

ens-era society that resulted in urban overcrowding and crime, gin factories and exploitation of child labor and in turn fueled government regulation and eventually unionization itself.

Unless the promoters of the information revolution are willing to see the process come full circle, they'd better stop feeling smug and start considering their larger roles in society.

■

The best laid plans of mice and men go up in smoke when dealing with IBM.

Last week's column about forthcoming IBM price cuts on its 3080 series mainframes may have seemed a little out of place in light of the front-page story detailing IBM's already announced plans to make those price cuts.

Unfortunately for this writer and the quoted analyst, last week's column was shipped out to the printer one day before IBM actually made the announcement and one day too late to kill the story. That's life when you have production deadlines and are dealing with a company like IBM that seems to have a knack for embarrassing forecasters.



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Unions intensify organizing efforts at Mass. high-tech firms

During the past year, unions have stepped up their organizational efforts at electronics companies based near Rt. 128, the bypass around Boston that the Massachusetts government has dubbed "America's Technology Highway."

The Communications Workers of America (CWA), International Brotherhood of Electrical Workers, United Automobile Workers, International Association of Machinists and Amalgamated Clothing and Textile Workers unions have banded together to woo workers in this area.

David Ellis, an attorney with the Boston-based firm of Foley, Hoag & Elliott, who specializes in helping companies douse union brushfires, claimed there is significant activity occurring along Rt. 128.

"Some of our clients are coming to us with evidence that organizing activities are taking place," Ellis said. "That's much more than we've seen in this industry in the past." He declined to identify those companies who have sought his help.

Major Rt. 128 computer makers — Data General Corp., Digital Equipment Corp., Wang Laboratories, Inc. and Prime Computer, Inc. — maintain that little or no organizing activity has taken place at their plants. DEC spokesman Jeffry Gibson said minor pamphleteering by union activists occurred at some plants about a year ago, activities he described as union "fishing expeditions."

Rand Wilson, an organizer in New England for the CWA, asserted that his union has not targeted any specific companies in the Rt. 128 area. Rather, he said, the CWA is assisting workers by providing education and advocacy on their behalf. The CWA and other unions are helping to produce the "High Tech Workers Network" newsletter, which in recent issues has carried articles about workers' concerns and problems at Massachusetts-based companies such as DEC, Analog Devices, Inc., Honeywell, Inc., Lexidata Corp. and M/A-Com, Inc.

The unions' collective effort has yet to result in a major organizational campaign or official representation election at a Rt. 128 electronics company.

"I don't see majority support at any of the companies now for unionization," Wilson said.

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UNION from page 113

tion is not an issue."

While some union representatives interviewed conceded that electronics companies have generally good records in the area of employee relations, others disputed that contention. "The real issue is just how great it is to work at [Wang Laboratories, Inc.] or [Digital Equipment Corp.] or IBM," said Rand Wilson, an outspoken organizer in New England for the Communications Workers of America (CWA). "It's not all it's cracked up to be. Plenty of these places are high-tech sweatshops."

Other explanations for why unions have been unable to make significant inroads into the industry are the relative youth of its workers and their degree of job mobility.

"In good times, employees know that if they are not happy where they are working or want more money, they can just go across the street," said Charles Elkind, an AEA vice-president who specializes in employee relations. "When things tighten up, their attitudes will become more conservative."

Labor officials also pointed to what they perceive as an antiunion stance taken by the Reagan administration and the National Labor Relations Board. As one union organizer put it, "The whole climate for union organizing right now is extremely depressing."

In the election at Scientific-Atlanta, a company spokesman claimed the union "had a great deal of difficulty finding an issue" around which to rally support.

Mike Lucas, an organizer for the IBEW in the Southeast, disputed that statement, saying workers came to the union complaining about favoritism in promotions, layoff and transfer policies and the lack of a grievance procedure. The union has filed an objection to the election, charging the company with "intimidation and coercion" in the voting process.

Sanders Associates' Parks said unions have been focusing increasingly on nontraditional issues, such as health and safety, women's concerns, career growth and equal employment opportunity, rather than wages, benefits and working conditions. The reason, he said, is that electronics companies generally offer good salaries and benefits.

Union organizers contended, however, that the attention given to the generous salaries paid to engineers and other highly skilled profession-

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COMPUTER INDUSTRY

NICKELS from page 130

from a change in April to the equity method of accounting from SMC Seicom, due to the reduction in SMC's common stock ownership in SMC Seicom from 64% to 36%.

■

Denelcor, Inc. announced that it had a loss of $2.9 million, or 38 cents per share, on revenues of $356,000 for the second quarter, compared with a loss of $2 million, or 32 cents per share, on revenues of $168,000 for the comparable period in the prior year.

■

The MacNeal-Schwendler Corp. reported revenues for the three months ended July 31 totaled $3.6 million, an increase of 31% over the $2.7 million reported for the second quarter of last year.

Income from operations was $1.1 million, an increase of 27% over the $914,000 reported for the same period last year. Profits of $798,000 were up 19% from the $670,000 reported for the second quarter of last year. Profits per share were 14 cents, compared with 12 cents for the same period one year earlier.

■

Altos Computer Systems, Inc. announced revenues for the fourth quarter of $32.9 million, an increase of 57% compared with $21 million in the same quarter a year ago. Profits grew 63% to $3.7 million, or 24 cents per share, up from $2.2 million, or 15 cents per share, last year.

■

Emulex Corp. announced revenues for its fiscal year ended July 1 of $80.1 million, compared with $34.3 million for the same period last year. Profits were $11.7 million, or 88 cents per share, compared with $5.5 million, or 45 cents per share, in the comparable period one year earlier.

■

Softech, Inc. reported revenues for the three months ended May 31 of $10.8 million, compared with $11 million one year ago. Profits were $547,000, or 15 cents per share, compared with $728,000, or 20 cents per share, for the same period last year.

■

Zitel Corp. announced profits for the third quarter of 1984 of $403,000, or 9 cents per share, compared with $366,000, or 13 cents per share, in the comparable period in 1983, because the respective weighted average number of common shares increased to 4,608,000 for 1984 from 2,939,000 in 1983.

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UNION from page 131

als ignores the fact that assembly-line workers are paid considerably less than their counterparts in heavy industry. "At some point, pay is going to become an issue if companies don't start to raise pay," the AFL-CIO's McDonald said.

The CWA and other unions have also been vocal about occupational health concerns. In one recent incident, the CWA's Wilson charged that M/A-Com, Inc., a Burlington, Mass., telecommunications maker, was guilty of gross negligence after a laboratory worker died after reportedly exposing himself to toxic arsine gas. The company, which contends the death was a suicide, accused the union of trying to exploit the incident to further its own organizing goals.

Whatever the issues, it has become clear that organized labor is not going to unionize the industry overnight. McDonald said unions need to establish a long-term relationship with employees in order to improve labor's credibility, "which is currently lacking."

"I think we're in for a long struggle," he said. "We're going to do it, but it's going to take a lot of time and patience."

CONGRESS from page 113

"We can't take for granted our past economic and technological world leadership."

He said he disagreed with the idea that Japan's Ministry of International Trade and Industry (Miti) was the reason for that country's technological success. Miti's power is being phased out, he said, and Japan, like the U.S., is being driven by worldwide competitive and economic conditions.

Lungren recommended a shift away from proposed centralized policies, specifically the LaFalce Plan currently before Congress, which would target mature and emerging industries. It would just redistribute what we already have and not promote new growth, Lungren said. The fact-finding series could impact several bills before Congress, including the Bradley-Gephardt flat tax bill, the Kemp-Kasten bill to reduce the capital gains tax, the Stephen-Wydler Act governing technology transfer from government research and development labs and amendments to the Simpson-Mazolli immigration bill, a Lungren aide said.

Witnesses urged continuation of the R&D tax credit due to expire in 1985, eliminating taxes on fringe benefits and incentive stock options, liberalizing export controls on high-tech products and eliminating proposals to restrict the rights of U.S.-trained foreign employees to remain in the U.S. and work.

Washington, D.C., economist Charles Bradford, assistant director of the Joint Economic Committee, said that Japan, Inc. poses the fiercest competition to U.S. high-technology industries. Bradford said that while Japanese management styles, quality circles and work ethics were important, the real issues had to do with Japan's superiority in foreign trade policies, domestic capital formation and technology licensing. Japan's low cost of capital and broad total savings base are the keys to Japan's R&D and technological successes, Bradford said.

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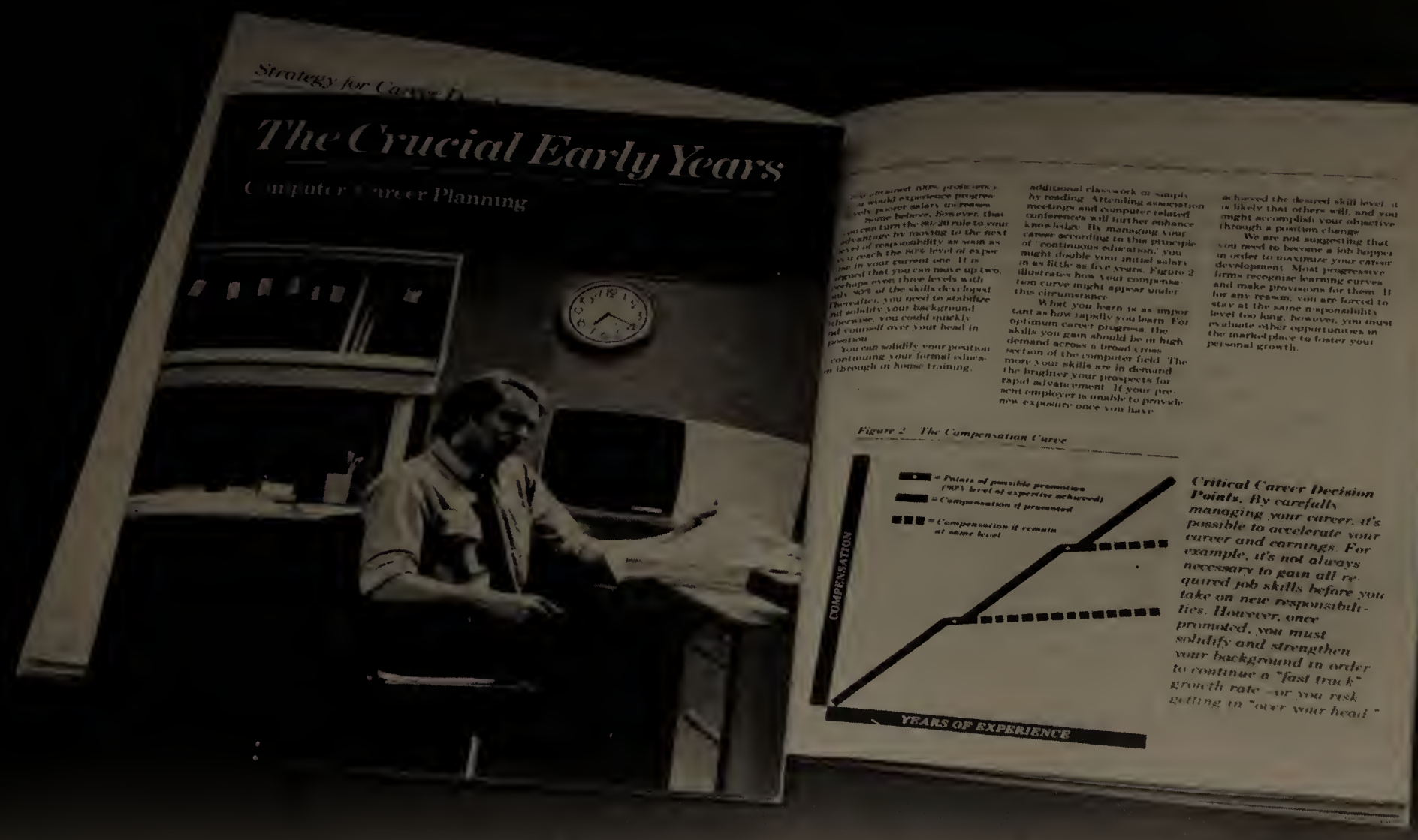
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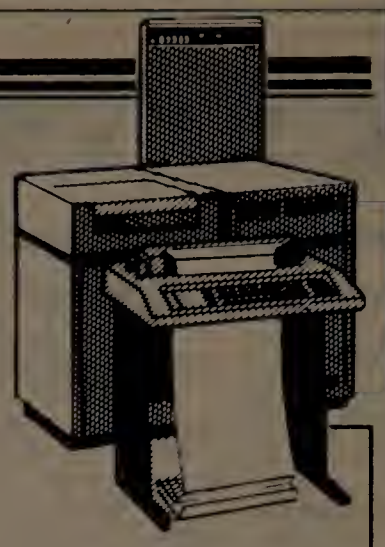
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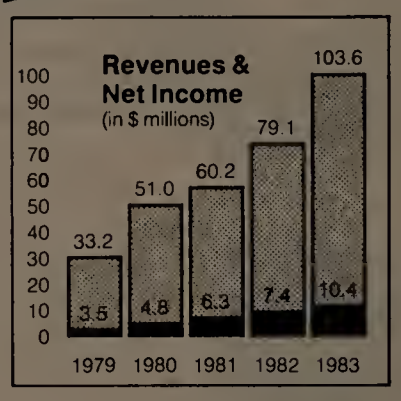
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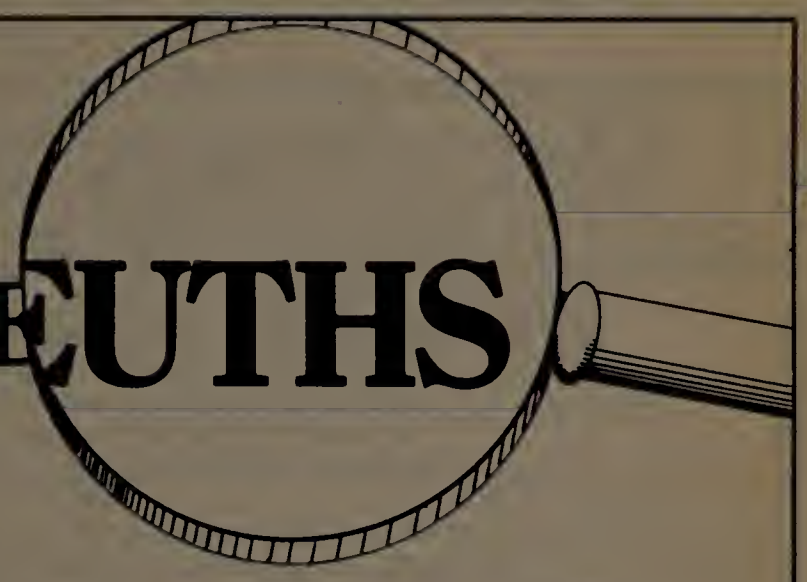
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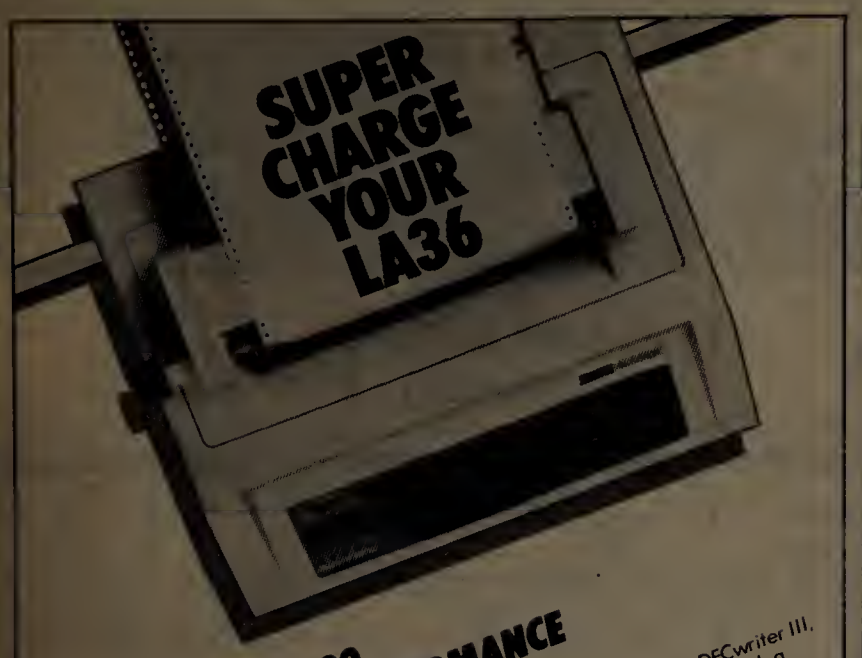
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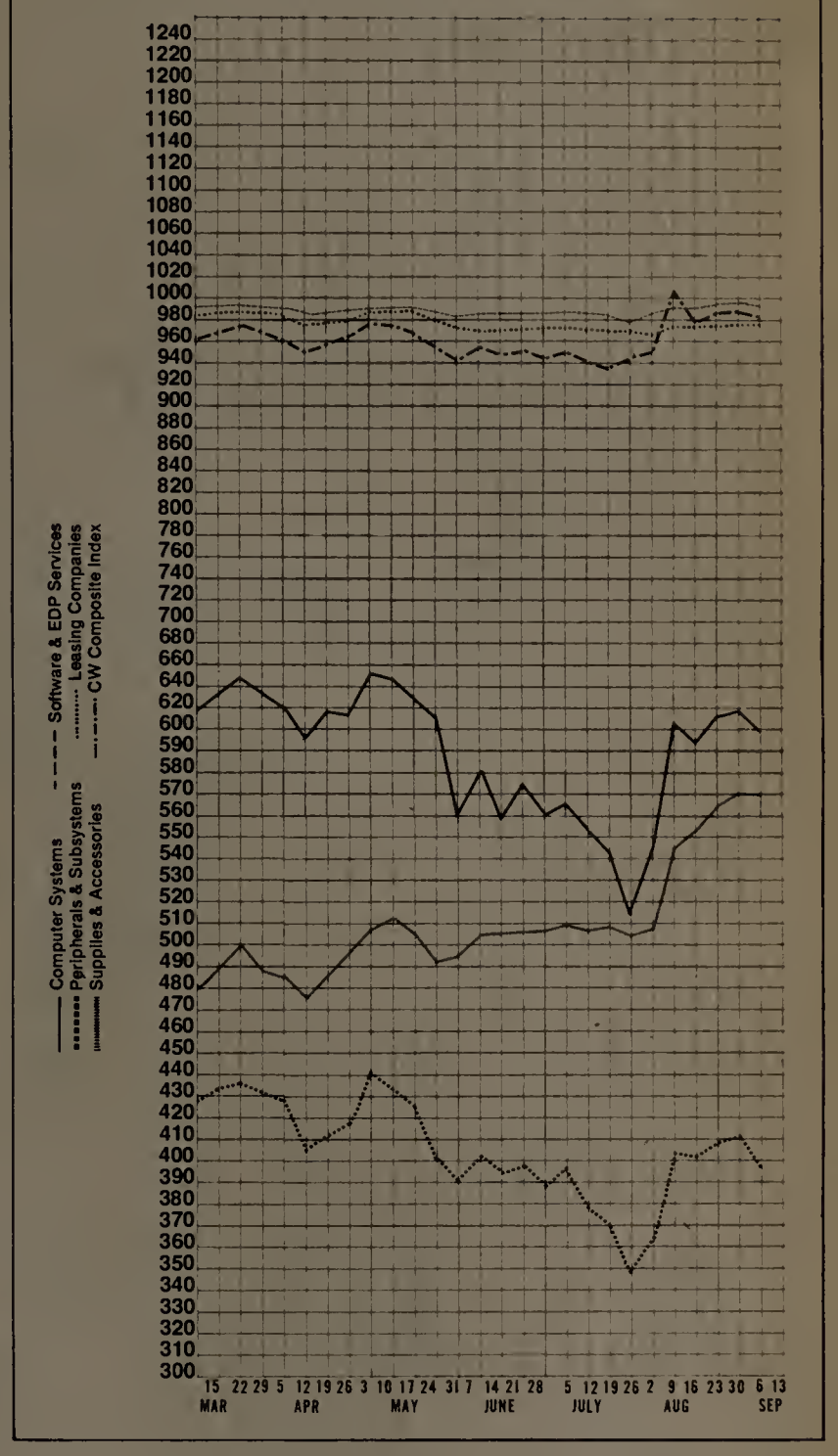
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A	AMDAHL CORP	10- 30	11 7/8	- 3/4	-5.9
O	APPLE COMPUTER INC	18- 63	26 1/4	-1 1/4	-4.5
N	AT&T	15- 21	18 7/8	- 1/4	-1.3
N	BURROUGHS CORP	44- 59	54 1/2	-2 3/8	-4.1
O	COMPUTER AUTOMATION	5- 17	5 1/8	+ 1/8	+2.5
A	COMPUTER CONSOLES	14- 26	17 3/4	- 1/8	-0.6
N	CONTROL DATA CORP	25- 62	29 1/2	-1 1/4	-4.0
O	CONVERGENT TECHNOL	10- 41	14 1/2	- 1/2	-3.3
N	CRAY RESEARCH INC	39- 98	86 3/8	-2	-3.4
N	DATA GENERAL CORP	27- 89	85 7/8	-2 5/8	-4.4
N	DATAPOINT CORP	16- 31	16 3/8	- 3/4	-4.3
N	DIGITAL EQUIPMENT	64-125	94 1/4	-3 7/8	-3.9
A	EECO INC	12- 16	13 5/8	+ 1/8	+0.9
W	ELECTRONIC ASSOC.	3- 15	3 1/2	- 1/8	-3.4
N	FLOATING POINT SYST	13- 44	17 7/8	- 3/8	-2.0
N	FOXBORO	28- 47	31 1/8	- 3/4	-2.3
O	GENERAL AUTOMATION	7- 16	7 7/8	- 1/2	-5.9
N	GOULD INC	24- 44	30 5/8	- 1/8	-0.4
N	HARRIS CORP	23- 49	28 5/8	-1	-3.2
N	HEWLETT-PACKARD CO	31- 48	38 5/8	-2	-4.8
N	HONEYWELL INC	45- 69	63	- 3/8	-0.5
N	IBM	103-134	122 3/8	-1 7/8	-1.5
O	IPL SYSTEMS INC	3- 14	3	- 1/2	-14.2
N	M/A-COM INC	13- 35	20 1/2	0	0.0
N	MANAGEMENT ASSIST	9- 29	28 1/4	- 1/8	-0.4
N	MATSUSHITA ELEC(ADR)	60- 88	66 1/2	-2	-2.8
N	MODULAR COMPUTER SYS	6- 16	8 1/2	- 1/8	-1.4
N	MOHAWK DATA SCI	9- 17	14 1/8	+ 3/8	+2.7
N	MOTOROLA INC	29- 49	41 5/8	-1 1/4	-2.9
N	NAT'L SEMICONDUCTOR	11- 20	15 3/8	- 1/8	-0.8
N	NBI INC	17- 36	19 3/8	- 1/8	-0.8
N	NCR	21- 34	26	- 3/4	-2.8
N	PERKIN-ELMER	18- 37	23 1/2	- 7/8	-3.5
N	PRIME COMPUTER INC	11- 26	18	- 3/4	-4.0
N	SPERRY CORP	35- 50	38 7/8	-1 5/8	-4.0
O	TANDEM COMPUTERS INC	15- 40	14 7/8	- 3/8	-2.4
N	TANDY CORP	25- 62	27 3/4	+ 3/8	+1.3
O	TELEVIDEO SYSTEMS	4- 41	5 1/4	- 3/8	-6.6
O	TELXON CORP	8- 16	14 3/4	0	0.0
N	TEXAS INSTRUMENTS	101-168	143 3/8	-1 5/8	-1.1
A	ULTIMATE CORP	15- 24	22 1/2	-1 1/2	-6.2
O	VECTOR GRAPHICS INC	1- 9	5 5/8	-	-9.1
A	WANG LABS "B"	24- 42	26 1/4	-1 3/4	-6.2
A	WANG LABS "C"	24- 42	26 3/4	-1 1/8	-4.0
N	XEROX CORP	35- 52	37 3/8	-2 1/8	-5.3
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 22	20 3/4	- 1/2	-2.3
N	COMDISCO INC	10- 42	12 5/8	- 1/2	-3.8
O	CONTINENTAL INFO SYS	5- 16	5 7/8	- 1/4	-4.0
N	DPF INC	10- 15	13 1/2	+ 7/8	+5.9
O	PHOENIX AMERICAN INC	6- 17	7 1/2	0	0.0
O	SELECTERM INC	11- 21	13	+ 1/4	+1.9
N	U.S. LEASING	29- 44	35 1/2	+ 1/4	+0.7
	COMPONENTS				
N	ADVANCED MICRO DEV	25- 41	39 1/8	-1 1/2	-3.8
O	ADV'D SEMICONDUCTOR	16- 38	24	- 1/2	-2.0
N	ANALOG DEVICES INC	20- 32	27	-2	-6.8
O	ANALOGIC CORP	10- 31	12 1/2	- 1/4	-1.9
N	APPLIED MAGNETICS CP	9- 37	10 1/8	- 3/4	-8.8
N	TERADYNE	23- 39	30 3/4	-2	-6.1

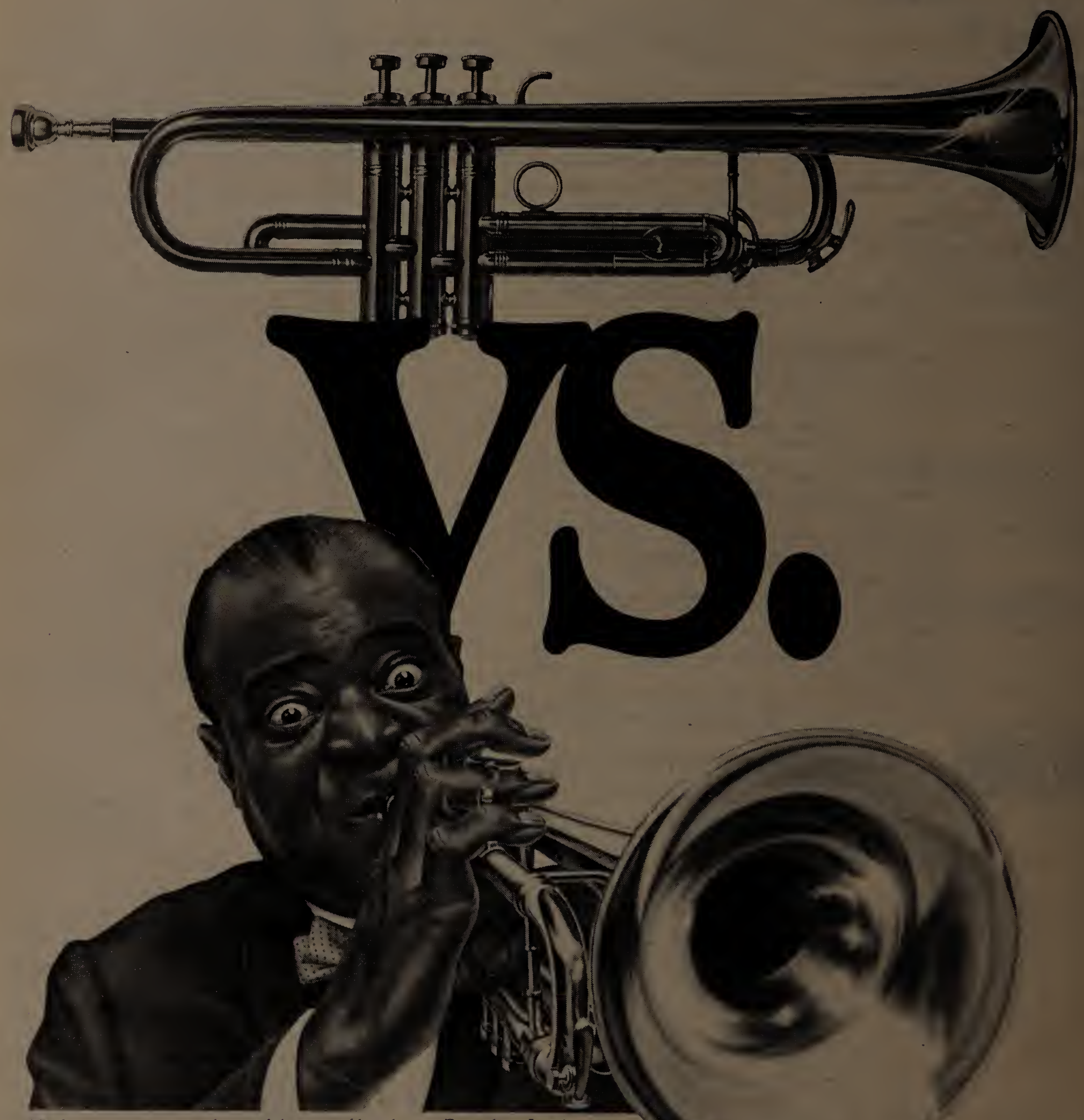
EXCH		1983-84 RANGE (1)	CLOSE SEPT 5 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	3- 8	3 1/2	D	0.0
N	ADVANCED SYSTEMS INC	14- 22	17 3/4	0	0.0
D	AGS COMPUTERS INC	11- 32	11 3/4	- 1/2	-4.0
D	AMERICAN SOFTWARE	13- 31	15 3/4	0	0.0
N	ANACOMP INC	2- 19	2 1/8	- 1/8	-5.5
O	ANALYSTS INTL CORP	5- 17	5 1/4	- 1/2	-8.6
A	APPLIED DATA RES.	18- 37	24 3/4	- 1/4	-1.0
O	ASK COMPUTER SYSTEMS	13- 21	18 1/2	- 1/4	-1.3
B	ASTRODYNE COMP IND	1- 7	1 7/8	- 3/8	-18.9
N	AUTOMATIC DATA PROC	30- 44	37 7/8	- 1/8	-0.3
O	CGA COMPUTER ASSOC	9- 17	11 7/8	- 1/4	-2.0
O	COMPUTER ASSOC INT'L	15- 35	18	-1 1/4	-6.4
O	COMPUTER HORIZONS	8- 20	6 1/8	0	0.0
O	COMPUTER NETWORK	5- 11	5	0	0.0
N	COMPUTER SCIENCES	11- 23	14 1/8	+ 1/4	+1.8
O	COMPUTER TASK GROUP	12- 19	14 1/2	0	0.0
O	COMPUTER USAGE	6- 18	11 5/8	- 1/8	-1.0
O	COMPUTONE SYSTEMS	4- 23	4 3/4	0	0.0
O	COMSERV CORP	1- 16	2 5/8	+ 1/8	+5.0
O	COMSHARE	7- 14	8 1/4	- 3/4	-8.3
N	CULLINET SOFTWARE	24- 50	43 3/4	- 7/8	-1.8
O	CYCARE SYSTEMS INC	16- 25	20 1/4	- 1/4	-1.2
N	ELECTRONIC DATA SYST	25- 45	45 1/8	+ 3/8	+0.8
O	HOGAN SYSTEMS INC	10- 27	13 3/8	+ 1/8	+0.9
N	GENERAL ELECTRIC CO	45- 59	56 1/4	- 3/4	-1.3
N	GTE CORP	36- 48	39 5/8	-1 1/2	-3.6
N	INFORMATICS GENERAL	15- 32	18	+1 1/4	+7.4
O	INFORMATION SCIENCE	5- 17	4 1/2	0	0.0
O	INFOTRON SYSTEMS CP	24- 43	28 1/2	-4 1/4	-12.9
O	KEANE ASSOCIATES	6- 15	12	+1	+9.0
A	LOGICON	18- 31	29 3/8	+ 1/8	+0.4
O	MCI COMMUNICATIONS	6- 28	7 1/2	- 1/2	-6.2
O	MNGT SCI AMER INC	11- 33	12 3/4	0	0.0
O	MATHEMATICAL APP GRP	6- 18	6 1/2	0	0.0
O	MICOM SYSTEMS INC	31- 50	35 1/4	- 1/4	-0.7
O	MONCHIK-WEBER CP	6- 22	14	0	0.0
O	NATIONAL DATA CORP	14- 26	15 5/8	- 3/8	-2.3
O	ON-LINE SOFTWARE INT	8- 29	7 1/2	- 1/2	-6.2
O	PANSOPHIC SYSTEMS	11- 30	12 3/8	- 5/8	-4.8
N	PLANNING RESEARCH	12- 21	12	-1 1/4	-9.4
O	POLICY MGMT SYSTS CP	22- 35	25 1/2	- 1/2	-1.9
O	PROGRAMMING & SYS	4- 8	5 3/8	0	0.0
O	REYNOLDS & REYNOLD	28- 53	34 1/4	-3	-8.0
O	SEI CORP	13- 34	14	-1	-6.6
O	SHARED MEDICAL SYST	23- 43	25 3/8	+ 1/8	+0.4
O	SCIENTIFIC COMPUTERS	8- 14	9	- 1/2	-5.2
O	SOFTWARE AG	9- 15	14	+ 1/2	+3.7
N	URS CORP	10- 18	12 1/2	+ 1/8	+1.0
N	UCCEL	7- 17	10 1/4	- 1/2	-4.6
	PERIPHERALS & SUBSYSTEMS				
P	[illegible] INTERNATIONAL	2- 7	3 1/4	0	0.0
A	ANDERSON JACOBSON	7- 26	7 1/2	0	0.0
O	AUTO-TROL TECHNOLOGY	10- 29	13 1/2	- 1/2	-3.5
O	AVANT-GARDE COMPUTNG	15- 29	23 1/2	+ 1/4	+1.0
O	BANCTEC INC	6- 22	5 3/4	- 1/4	-4.1
A	BEEHIVE INT'L	2- 15	3	+ 3/8	+14.2
N	BOLT,BERANEK & NEW	17- 30	22 1/4	- 1/8	-0.5
O	CAMBEX CORP	1- 3	2 3/8	- 1/8	-5.0
N	CENTRONICS DATA COMP	8- 28	8 7/8	-1 1/8	-11.2
A	CETEC CORP	7- 12	8 7/8	- 1/8	-1.3
A	CODNITRONICS	4- 20	5 3/8	- 3/8	-6.5

EXCH		1983-84 RANGE (1)	CLOSE SEPT 5 1984	WEEK NET CHNGE	WEEK PCT CHNGE
D	COMPUTER DEVICES INC	1- 1	1/8	- 1/8	-50.0
D	COMPUTER TRANSCEIVER	2- 10	1 3/4	0	0.0
N	COMPUTERVISION CORP	29- 53	41 1/4	-3 1/2	-7.8
N	CONRAC CORP	11- 24	13 1/4	- 1/4	-1.8
A	DATAPRODUCTS CORP	16- 32	22 3/4	+1 1/8	+5.2
A	DATARAM CORP	5- 12	5 1/8	- 1/2	-8.8
D	DATA SWITCH CORP	6- 41	6 1/2	- 1/2	-7.1
D	DATUM INC	8- 17	6	D	D.D
O	DECISION DATA COMPUT	9- 16	11 7/8	- 1/4	-2.0
O	OOCUTEL-OLIVETTI	6- 39	6 1/4	- 1/2	-7.4
N	ELECTRONIC M & M	5- 11	7 3/8	- 1/8	-1.6
O	ENDATA, INC	8- 16	8 1/4	- 1/4	-2.9
O	EVANS & SUTHERLAND	13- 50	20 1/4	+ 1/2	+2.5
O	GANDALF TECHNOLOGIES	9- 14	13	- 1/4	-1.8
N	GEN'L DATA COMM IND	10- 20	20	+ 1/8	+0.6
O	GREAT SOUTHWEST IND	1- 3	1/2	0	0.0
N	HAZELTINE CORP	16- 33	32 3/4	+ 3/8	+1.1
O	ICOT CORP	3- 8	3 3/4	0	0.0
D	INFORMATION INTL INC	10- 19	11	0	0.0
O	INTEL CORP	27- 45	34 1/2	-2 1/4	-6.1
A	LUNOY ELECTRONICS	7- 19	8 1/2	0	0.0
O	MEGADATA CORP	8- 15	12 3/8	+ 1/8	+1.0
A	MSI DATA CORP	10- 25	10 3/8	+ 3/8	+3.7
N	NASHUA CORP	19- 29	25	-1 1/2	-5.8
D	NETWORK SYSTEMS CORP	16- 34	26	0	0.0
N	NO AMERICAN PHILIPS	30- 40	35 5/8	-1 1/4	-3.3
N	NORTHERN TELECOM LTD	30- 49	40 5/8	- 1/2	-1.2
D	OMEX	1- 6	1/8	- 1/8	-50.0
N	PARADYNE CORP	12- 28	14	- 7/8	-5.8
A	PENRIL CORP	9- 14	13 5/8	+ 5/8	+4.8
O	PHOENIX AMERICAN INC	6- 17	7 1/2	0	0.0
N	PLESSEY CO (ADR)	25- 41	26 3/4	- 1/4	-0.9
O	PRINTRONIX INC	16- 34	22 1/2	+ 1/2	+2.2
O	RAMTEX CORP	6- 23	7	+ 3/4	+12.0
N	RECOGNITION EQUIP	10- 17	13 1/8	- 5/8	-4.5
N	ROLM CORP	30- 80	45 3/4	- 5/8	-1.3
N	SANDERS ASSOCIATES	36-120	44 7/8	-2 5/8	-5.5
O	SCAN DATA	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	9- 19	11	+ 1/4	+2.3
N	SCIENTIFIC ATLANTA	8- 23	8 1/2	- 3/8	-4.2
N	STORAGE TECHNOLOGY	7- 23	10 5/8	- 5/8	-5.5
O	SYKES DATATRONICS	2- 13	2 3/4	0	0.0
O	SYSTEMS & COMP TECH	20- 39	28 5/8	- 5/8	-2.1
A	T BAR INC	7- 17	9 7/8	+ 3/4	+8.2
A	TAB PRODUCTS CO	13- 20	17 3/4	+ 1/2	+2.8
D	TANDON CORP	7- 35	8 1/4	- 3/4	-8.3
A	TEC INC	8- 12	11	-1	-8.3
N	TEKTRONIX INC	52- 87	65 1/2	- 3/4	-1.1
N	TELEX	19- 34	32 3/4	- 1/2	-1.5
O	TESDATA SYSTEMS CP	2- 17	2 1/4	- 1/8	-5.2
N	TIMEPLEX INC	13- 23	18 3/8	-1 3/8	-6.9
O	VISUAL TECHNOLOGY	7- 26	8 1/2	-2 1/4	-25.7
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	17- 23	22 3/8	0	0.0
N	BARRY WRIGHT	22- 33	30 3/8	- 5/8	-2.0
A	DUPLEX PRODUCTS INC	22- 27	26 1/2	- 1/4	-0.9
N	ENNIS BUS. FORMS	18- 28	24	+ 3/4	+3.2
N	3M COMPANY	89- 90	81 3/4	- 5/8	-0.7
N	MOORE CORP LTD	35- 51	40 1/2	- 1/2	-1.2
O	STANDARD REGISTER	27- 40	39 1/2	+ 1/2	+1.2
N	WALLACE COMP SERVICE	23- 33	29 1/8	- 1/8	-0.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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